
SALE: MODEL 15 SYNC 60 wpm, table S80. MODEL 14 sync TD & gov. typing reperf 60 wpm \$70. LW HERRING, Box 26, Orrtanna, PA. 17353 OR 2409 Inwood, Dallas, TX. 75235.

CLEANING HOUSE - FOR SALE: Time interval unit plug in for HP, Northeastern, FR38 and others. Model MX-1636/U (HP 526 B) \$15.00 PPD. Decimal counting units 700A; rack mounting adapter for LM freq. meter \$10.00 PPD. TS268 \$5.00 PPD. Tube tester adapter MX949/U \$7.50 PPD. Digitec digital volt meter model 201, \$40. OOPPD. Collins ARR-15 100KC xtal calibrator \$3.00 PPD. J.J. Buckler, 29 Parkview Dr. Plains, PA. 18705.

TT-4A/TG KLEINSCHMIDT PORTABLE page printer w/kbd, used - good condition, price \$48.00 with 60 and 100 wpm gears. Freight - \$20. east of - \$10.00 west of Miss. River. AD-DC goverend motor, all standard KSR functions plus motor stop. Units cleaned and tested at speed desired. Parts in stock. Mark/Space Systems, 3563 Conquista, Long Beach, CA. 90808. (213-429-5821.

COLLINS KW-1, \$850.00; 32V2, \$100.00. Viking-KW, \$400.00. 75A4 #5050, 0.5, 3.1, 6.0 filters, \$500.00. James Craig, 29 Sherburne Ave., Portsmouth, N.H. 03801. (603)-436-9062.

SALE: M15; M15 LESS KEYBOARD; M14 typing reperf chassis with 60 and 100 gears; Sel-cal; FRXD combination typing reperf and TeeDee chassis; ST-5 demodulator card on computer frequencies 2225M and 2025S; AK-1 card on computer frequencies 1270M and 1070S; W4DYE, 1223 Fenwick, Lynchburg, Virginia 24502; 703-239-0444.

Our classified section is growing - and presents a minor problem, space. As long as we run 20 pages we can fit it in, maybe last month was an exception with 3 pages, we will see what happens in the next few months. Most of the ads pull very well and we believe the readers appreciate them. As it is about the largest selection of RTTY advertised any place we would hate to cut down on them.

SAY OM! I'M NEW TO RTTY AND BOUGHT THIS STUFF FROM A GUY LEAVING TOWN, WHAT CAN YOU TELL ME ABOUT A SINGER REPERF?.



Drawing Courtesy "Bob" WA6WGL

FIRST CLASS MAIL



RTTY JOURNAL
P O Box 837
Royal Oak, Mich. 48068

RTTY

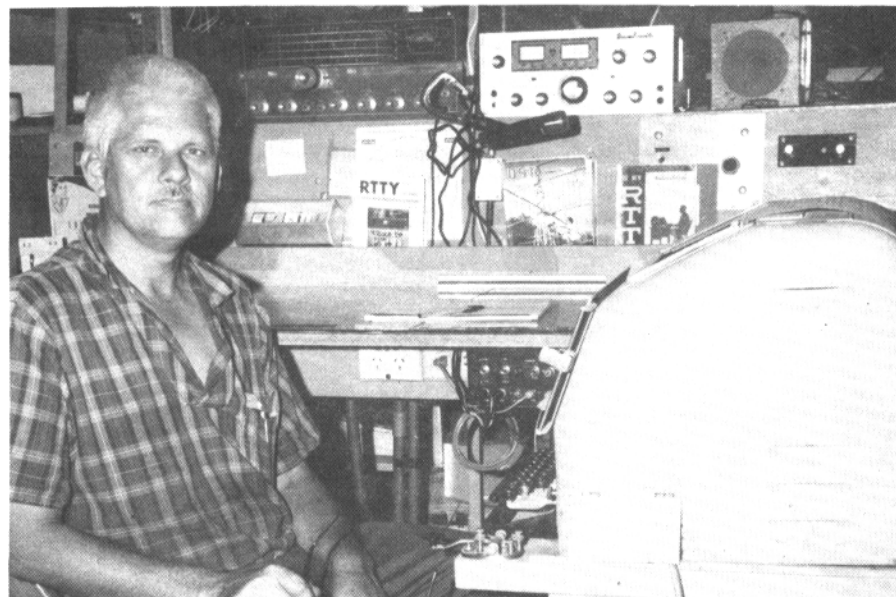
OCTOBER 1972

JOURNAL

EXCLUSIVELY AMATEUR RADIO TELETYPE

VOLUME 20 No 8

30 Cents



'George' VK9GG

CONTENTS

CRYSTAL CONTROL & NARROW SHIFT W/HEATH SB SERIES-	2
INTERNATIONAL RTTY - - - - -	3
FSK FOR THE SB101 - - - - -	4
SWITCHING MORE THAN ONE RIG - - - - -	5
IDENTIFYING SPEEDS - - - - -	6
LORENZ TELEPRINTERS - - - - -	6
MODIFYING THE HQ215 FOR AUTO START - - - - -	7
THEORY & APPLICATIONS - - - - -	8
RTTY FACES AROUND THE WORLD - - - - -	10
DX NEWS- - - - -	12
YAESU EXCITER ON RTTY- - - - -	13
HITS & MISSES- - - - -	14
ZONE SCORING POINT TABLE - - - - -	16
"FREEMAN" KH6AX - - - - -	17

Crystal Control and Narrow Shift with the Heath SB Series

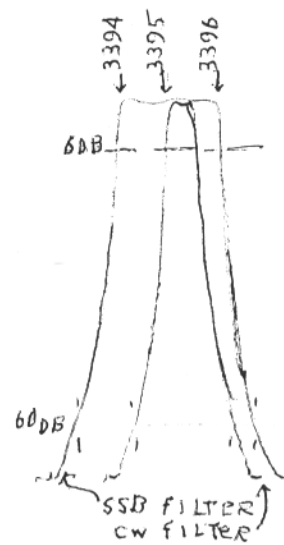
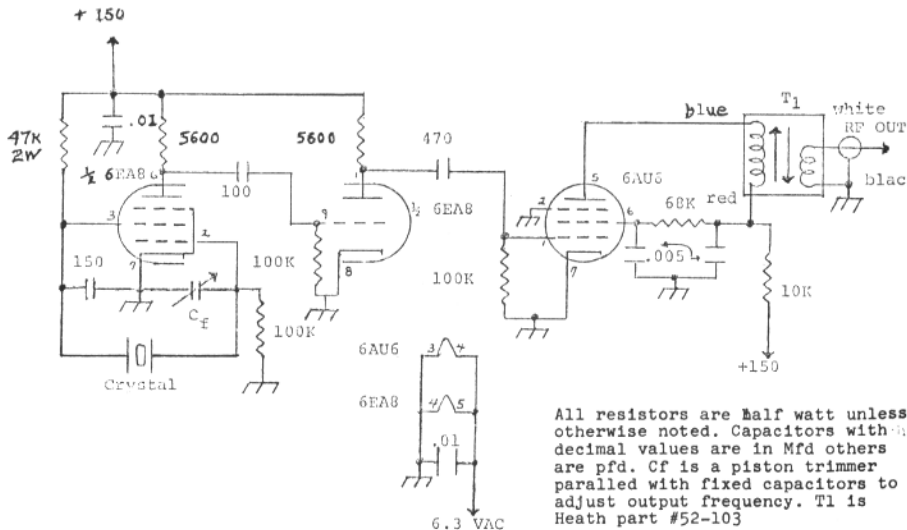
ROBERT CLARK, WA4VYL
823 Jones Ave.
MARYVILLE, TENN. 37801

The RTTY enthusiast interested in narrow shift auto-start faces two problems with the Heath SB-Series of receivers and transceivers. The first problem is modifying the receiver to receive narrow shift with the optional 400 hertz filter. This filter, unlike the SSB filter is centered at 3395.4 khz and will not pass the standard tones of 2125 and 2295 hertz. It is therefore necessary to move the BFO injection frequency to 3393.190 khz. This frequency is somewhat critical and dependent on the actual filter bandpass. It is possible to use a BFO crystal provided with the receiver to provide the proper injection frequency. 1

Although the Heath LMO is known for its extremely good stability, it will not hold the frequency well enough to provide unattended auto-start operation over a period of weeks or months. There are two solutions to this problem. One is to crystal lock the receiver. This is not quite the same thing as crystal control. In the crystal lock mode, a crystal is tied from the grid to ground of the variable oscillator tube. The oscillator tuning then allows varying the frequency about 50 hertz either side of the

frequency determined by the crystal. The fine tuning effect and the simplicity of this method make it quite desirable. On the negative side, the crystal lock method does not allow for quick change from one auto-start frequency to another and in many cases it is not possible to pull the crystal far enough to hit the desired frequency. It is usually possible to pull the frequency about 50 hertz. It may be difficult to purchase a crystal this close to the desired frequency, also crystals and oscillators have been known to change enough that the crystal lock method fails after a time. This is unusual however. I had the problem that the high quality (high price) crystal I ordered would not hit the frequency in the crystal locked mode. I decided that the XT-4 oscillator 2 with its low capacitors circuit would allow more variation in output from a given crystal than any other oscillator that I was familiar with. The XT-4 was built and the output frequency was adjusted to center the receiver on the auto-start frequency. I had the receiver crystal controlled on the frequency now, but the receiver sensitivity was degraded by insufficient mixer injection from the XT-4. Several cures were tried, such as tuned output on the XT-4, but the injection was insufficient in all cases until a buffer stage was added.

The diagram shows the basic XT-4



with the FS keyer removed. It would be advisable to review Hoff's article on the XT-4 concerning parts and calculation of crystal frequency. He also gives ordering information for the crystals which should be followed carefully. For general information, I ordered a 5425.0 crystal for the 14075 khz auto-start frequency. When placed in the XT-4

INTERNATIONAL RTTY

There is no question that RTTY is growing fast in other countries. In many cases the RTTY groups are formed as a group within the National Society. In this country there is no national organization or even strong local clubs promoting RTTY. Much material is available here however from amateur magazines and with the large geographical area and great number of amateurs help is usually available. We doubt if a national organization would be supported. Carl Keel, KB9P sends us information on some of the foreign societies and we are printing some here to show what is being done elsewhere.

Last weekend we had the annual meeting of our Swiss Rtty-Society here at Zurich and about 65 attended. We had two papers on: "how to write your RTTY on your Television screen", which aroused very much interest. We also demonstrated the new HAL-VIDEO-CONVERTER and everybody was amazed, by this new method which eliminates the noisy teleprinter. We had visitors from Germany, Austria and Holland.

and properly centered on frequency the crystal oscillator output measured 5224.229 khz. It was not possible to pull the crystal this far (almost 800 hertz) in the crystal lock mode, but was no problem at all with the XT-4. In fact, I could have moved it considerably farther.

T1 in the diagram is a bandpass transformer available from Heath (#52-103) for \$4.30. The RF output from the modified XT-4 is routed to a ceramic switch which selects either the original LMO or one of several XT-4 oscillators. The oscillator, buffer, power supply and regulator were built on a 4x6x3 minibox. It was a bit crowded, but everything was made to fit. It is important that the crystal be shielded from RF. If the oscillator is used in a room where wide temperature variations occur, it may be necessary to temperature compensate the oscillator to realize the high degree of stability necessary for unattended auto-start.

1. Robert Clark, "Narrow-Shift RTTY Reception with Heath SB Receivers," *Ham Radio*, October, 1971, p 64.
2. Irvin M. Hoff, "Crystal Controlled RTTY," *RTTY Journal*, December, 1967, p. 4.

1. **Switzerland:** Our National organization SWISS-ARTG has 58 members now. We are beginning to be active on VHF and UHF because the Meeting of the IARU-Region 1 which took place in May at Scheveningen Holland fixed new "Centerfrequencies" namely 145,3 433,3 and 1297,3 Mc. for RTTY.

2. **Italy.** I attended the 5th Italian RTTY-Conference May 29th at Lido di Camaiore. There were about 50 present. Lamberto i 1ROL was president. Alfonso i 1 CAQ got a silver Medal for his RTTY world championship. 71/72 Eugenio i 1 KG the last Champion was also present. The main discussion at the meeting was the project to make a new national RTTY-Association.

3. **Hungary.** I visited last week Zoltan HASFE at Budapest, at his callbook address. His age 42. He has a Lorenz 15 printer and a homebrew ST-6-Type Converter and works FSK with 150 Watts. He is electronic engineer. Actually he is the only active RTTY-Station in Budapest as HB5KBF and 5KBP have closed down. In Hungary are active: HA6KNB and KB6NA.

Charles Keel HB8P

FSK For the SB-101 - -

VERNON DILLAPLAIN, W5E00
124 Indian Trail
LITTLE ROCK, ARK. 72207

I have been using this method of FSKing the Heath SB101 and it seems to work well.

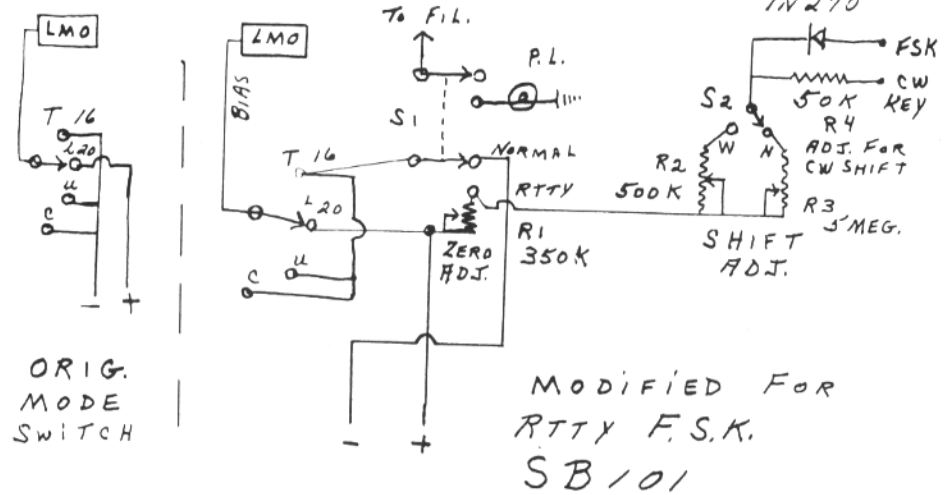
Inspection of the schematic shows that in LSB a + voltage is connected to the LMO thru the mode switch. In other modes a - voltage is applied to the LMO bias connection. In order to use the tune position on RTTY, I needed to have a + voltage on #16 rather than the - voltage as is normal. Then the voltage available from any mainline keyer would vary the voltage available to the LMO from the 101 regulators.

Remove the green wire from number 16 on the mode switch. See the Heath pictorial. Extend the wire to switch no. 1. Connect the swinger of this switch back to number 16. Connect a 350K pot between the other side of the switch and to number 20 on the mode switch. Then make the other connections as shown on the sketch. Change R 4 to make CW shift as desired.

The switches, pots and pilot light were mounted on a small aluminum panel that was bent in shape to fit along the left of the LMO box and a screw thru

an existing hole in the dial bracket in front of the LMO box serves to hold it on. Switch 1 is for normal Rtty operation and is DPDT. The other is for wide or narrow shift and can be SPDT. If I was doing it over I would make it a DPDT and add a pair of pilot light to indicate the shift. Pot number 1 is to zero the carrier back to the same freq. after you have changed the voltage thru the use of a different source. The other two pots are for adjustment of the two shifts. I used miniature pots and switches.

After connections are made, set VFO to the desired band and put unit in LSB. Tune in RTTY signal or a steady carrier. Set second receiver to same signal and observe both on scope. Turn excitation control to counter-clockwise off. Set mode switch to tune and Normal - RTTY SW to RTTY. Turn up excitation control until signal is observed on other receiver on the scope. Adjust the zero pot. to bring 101 transmitted signal to same freq. as the receiver was tuned to. Turn mode switch back to LSB and Exc. control full CC to off. Recheck SB 101 receiver to be on same freq. as originally tuned. Recheck other receiver to be on the same signal. Turn mode switch back to Tune and bring up excitation control to again observe signal on



the other receiver and scope. Recheck zero control pot. Then use counter or other means to set wide and narrow shift pots. Then finally recheck all controls. When you transmit RTTY, just turn the SB 101 in the tune position and turn up the excitation control for

the desired plate current. Remember it will be less than that used for CW or SSB, if you want to save the finals. To receive, just go to LSB. It's a good idea to use Heath RTTY crystal. Be sure to place S1 back in normal before using for other modes.

SWITCHING MORE THAN ONE RIG-

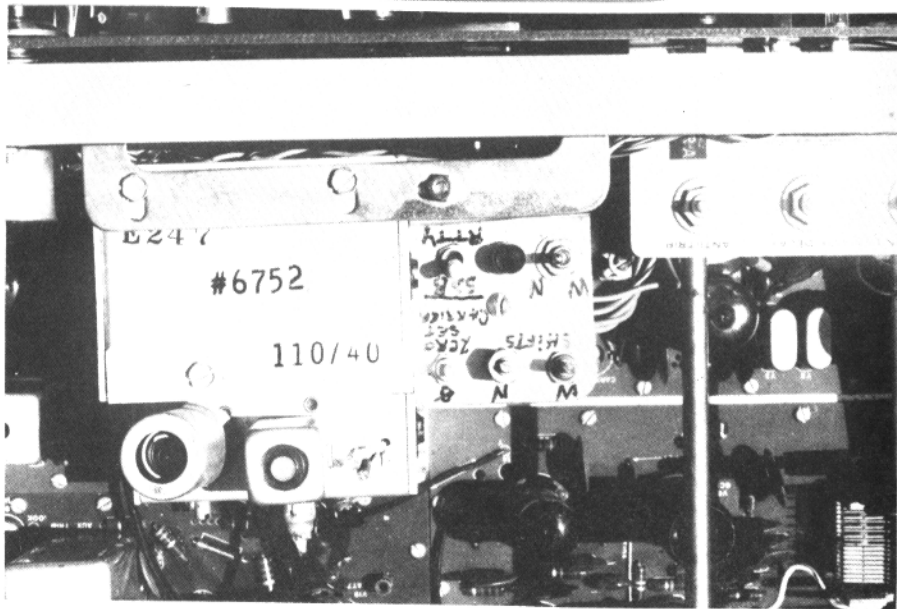
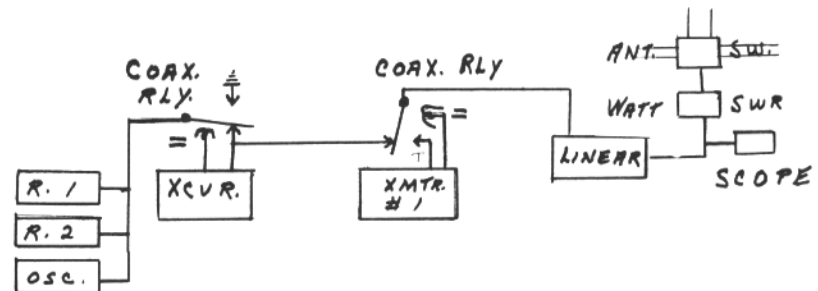
VERNON DILLAPLAIN, W5E00

After cooking some receiver front and coils because I forgot which transmitter I had on the line last, I devised the system shown here. In this way, I can use any combination of transmitter and receiver without changing any cables. Select the desired antenna and fire up the desired receiver transmitter combination. When the plate operate switch is thrown on the transmitter, the antenna coax relay on back of the transmitter disconnects the following units and the transmitter is connected automatically to the antenna system. When the plate switch is off, the coax relay

connects the antenna back down the line and the receivers are in operation.

In the sketch I have a SB linear that follows an Apache transmitter which is preceded by a SB101 transceiver. The receivers to the left include a Heath Mohawk and a Hammarlund HQ140x with a homebrew crystal oscillator on the line.

I can use the 101 with the linear... or the Apache with SB 10 SSB Adapter with the linear or each one separately in any mode. Any receiver can be used with any transmitter. Any unit that has to be pulled for service, with the exception of the linear, does not disrupt the other units. They will continue to operate as if all units were on the line.



IDENTIFYING VARIOUS SPEEDS -

PHIL CHADWICK, W3GMK
Route 2, Box 102
NEW HOPE, PA. 18938

Comments on March issue. Faster Speeds.

I agree in what has been said about identification of speeds in FSK & AFSK in principle, but there are several ways to go in indication of speed.

AFSK

The number of frequencies should be minimized so that in designing units only four or five frequencies will be needed (i.e. 170 frequencies plus 2975). In this way a simple rotary switch can be used to change shifts and if you are lucky enough to have a TTY with gear shifts maybe even link it. The following frequencies look realistic to me:

WPM	170 Shift	
60	2125-2295	
75	1955-2125	170
100	1785-1955	

850 Shift
2125-2975
1700-2550 425 apart
1275-2125

FSK

Cw ident part was good idea but

LORENZ Model 15 TELEPRINTERS -

The following information may be of value to some of the hams who have obtained one of the Lorenz Model 15 Teleprinters (sold several years ago by Atlantic Surplus and others).

These machines, when equipped with the proper gear sets may be operated at 60 or 75 or 100 wpm (only one speed with one set).

Gears and parts lists and instruction manuals are available from the manufacturer:

Standard Elektrik Lorenz AG
Box 40 07 49 D-7000
Stuttgart 40, West Germany

Give model and serial number of machine when writing. Delivery of parts is a little slow (one month). Quotations will be given in DM (Deutch Marks - don't know if that is spelled correctly- which are now 31c).

If any ham has questions on these machines I would be happy to try to help him get the answers. They are a fine

6 OCTOBER 1972

sending full number (except 60 wpm) is better since it is readily apparent to all. Could even use W3GMK/67 without confusion with portable districts.

Fsk shifts could be varied to indicate the speeds by the simple expedient of calibrating ones BFO knob every 100 cps, tune in to zero and move knob to zero beat the other side. Of course those with scopes would really be able to see the indication of shifts readily. The following shifts look good to me and roughly attainable by all:

WPM	Shift	
60	170/850	
67	220	50
75	270	
100	320	
Shift	170/850	
255		85 apart
340		
425		

This could roughly be translated to above or below 200 cps and above or below 300 cps in the first list or if the wider specs desired it would be above or below 200 cps and above or below 400 cps. By using WWV signals for tones scopes can be set up or bfo's can be roughly calibrated.

Frankly I think it will end up with 60 and 100 wpm except low frequency at 67. It might even help the FCC with some form of rough guide to speed.

machine, and include a tape perforator and a TD (tape reader) as did the old 19. Their only drawback is that you must print to operate the reperf so you can't print and cut tape independently. However you can print and use the keyboard separately.

H.R. Boone WØERS
1005 A Ave. NW
Cedar Rapids, Iowa 52405

GOOD IDEA- (if you do it)

Tape a medium size envelope in the back cover of the instruction book on your equipment. In this, put notes on test data, material needed from magazine articles and notes on changes you want to make the next time you have the unit out of the cabinet.

Vernon Dillaplain W5E00

RTTY JOURNAL

Modifying the HQ-215 for Auto-Start - -

D.E. CHAPMAN, W9DPY
670 N. Elizabeth St.
LOMBARD, ILL. 60148

I am running a couple of HQ-215's on the autostart frequencies. These receivers are basically very good but were ruined in their execution. (some design considerations and poor workmanship)

In the ones I am using, I have gone to 500 Cycle filters, a stock item with Newark and changed the IF beat crystal and added a crystal controlled oscillator to the tunable section. These changes would make the subject of an article as the HQ-215 is sensitive and reliable and draws only about 20 watts if handled properly.

The sensitivity is about 10X that of the Collins sets and with the added crystal oscillator the stability of 14075.000 is --5 cycles at normal room temperatures.

Attached are my work notes on the crystal oscillator for use in the HQ-215.

The actual oscillator is wired on a 9 pin miniature socket and the socket is "hung by its wires" under the os-

cillator deck of the HQ-215. Since the high side beat crystals in the HQ-215 are each trimmed with a mica trimmer no adjustment was allowed (arranged) on the added oscillator. The trimmers on the beat crystals are arranged one for each band--not a trimmer for each crystal. The only bad effect is if you remove the crystal oscillator, the calibration can be off a little due to the added capacity of the crystal components and to resetting the beat crystal trimmer.

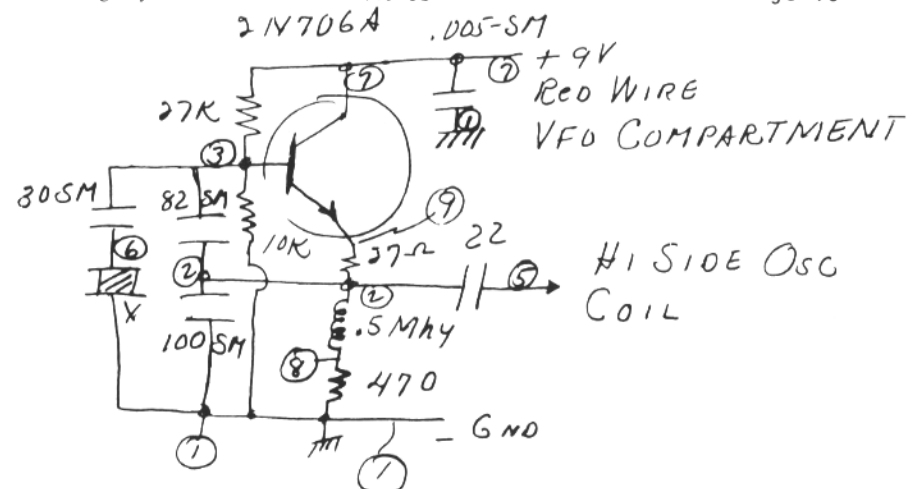
The USB IF crystal was changed to 452.825 to allow the beat tones to fall in the passband of the 500 cycle filter. See note A.

If the 2N706 oscillator is used as shown here, the dial can be used as a vernier control of frequency. About -50-70 cycles is normal.

The 30 pfd capacitor wired to the crystal can be made variable and a wide frequency adjustment made. If only one crystal is to be used, the 30 pfd can be changed to change frequency.

Ceramic capacitors are not stable enough for precision circuits. Do not use even "zero temperature coeffi-

Continued on Page 15



X = 2.624235 Inter. HA for 20- 14075

Unit wired on 9 pin socket- socket pins as circled (2)
SM- Silver micas- Resistors all 1/2 watt 10% Allen Bradley
X2 measures 2.624572 - 30pf load.
Osc. in K2KFV set 624220
IF crystal 452.825 & 452.750

RTTY JOURNAL

OCTOBER 1972 7

RTTY theory & applications.

RON 'RG' GUENTZLER, W8BBB
Route 1 Box 30
ADA OHIO, 45810



THE ASCII CODE

The American Standard Code for Information Interchange (ASCII) is now used almost to the exclusion of the Baudot Code for both wire-line and radio Teletype operation by commercial users. The Baudot Code is still used by amateurs and a rapidly decreasing number of commercial services.

Why has the ASCII code replaced the Baudot code? The reason is fairly obvious if one considers the severe limitations imposed by the basic structure of the Baudot Code. The Baudot Code contains five bits that convey the informa-

tion. (It is usually referred to as a 7 or 7.42 unit code, but 2 or 2.42 of the bits or units are used for synchronization purposes - stop and start pulses - and contain no information.) If each character is composed of 5 bits, only 32 characters are possible. This was considered adequate when the code was first accepted for general use because it was so much better than hand-keyed Morse. However, only 32 characters represent a severe limitation to information interchange. Because the Roman alphabet plus ten digits and minimal punctuation require 40 or more characters, most

Partial list of USA Standard Code for Information Interchange [ASCII, USAS x 3.4- 1967].

b ₄ b ₃ b ₂ b ₁	b ₇	b ₆	b ₅							
0 0 0 0	0	0	0	0	0	1	1	1	1	NUL
0 0 0 1	0	0	1	0	1	0	1	1	1	SOH
0 0 1 0	0	1	0	1	0	1	0	1	1	!
0 0 1 1	0	1	1	0	1	0	1	0	1	"
0 1 0 0	0	1	0	0	1	0	1	0	1	#
0 1 0 1	0	1	0	1	0	0	1	0	1	\$
0 1 1 0	0	1	1	0	0	1	0	1	1	%
0 1 1 1	0	1	1	1	0	0	1	0	1	&
1 0 0 0	1	0	0	0	0	1	0	1	1	'
1 0 0 1	1	0	0	1	0	1	0	1	1	(
1 0 1 0	1	0	1	0	0	1	0	1	1)
1 0 1 1	1	0	1	1	0	1	0	1	1	*
1 1 0 0	1	1	0	0	0	1	0	1	1	+
1 1 0 1	1	1	0	1	0	1	0	1	1	,
1 1 1 0	1	1	1	0	0	1	0	1	1	-
1 1 1 1	1	1	1	1	0	1	0	1	1	.
										?
										o
										DEL

code combinations must be used for two different characters; this requires shifting, a real nuisance. In addition, modern usage requires upper and lower case letters as well as many control functions. Thus, the Baudot Code is no longer desirable or useful.

(For type setting purposes, these requirements were needed many decades ago. This was resolved by using a different code for the Teletypesetter. If you ever see old Teletype equipment that uses a 6 hole tape, but otherwise looks quite similar to the standard Teletype Corp. M14 and M15 equipment, it is probably Teletypesetter equipment.)

The ASCII code contains 7 information bits, thus permitting 2 to the seventh power or 128 unique characters without shifting. In addition, it has an eighth bit which can be used for parity checking. Thus the ASCII code is called an eight unit or eight "level" code.

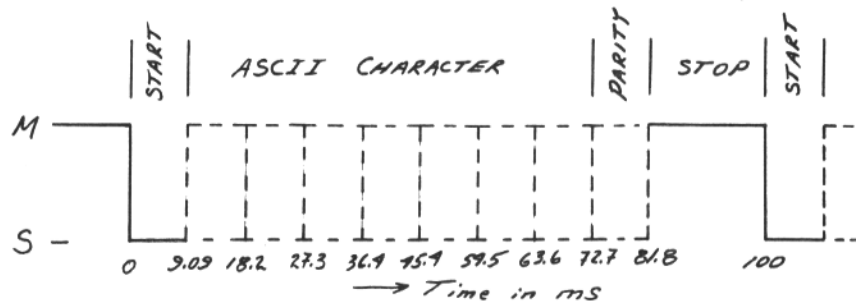
Some of the ASCII code combinations are given in the Table. Although not shown here, there is a character assigned to each of the 128 combinations. Characters with 00 in bit positions 6 and 7 are control functions. NUL is

the equivalent of a Blank in the Baudot Code. SOH stands for Start of Heading, EOT for End of Transmission, ACK is ACKnowledge, NAK is Negative ACKnowledge, LF and CR have the same meaning as in the Baudot Code as does DEL which is DElete - the equivalent of a Delete or Letters shift in Baudot. Perhaps the most important feature of the ASCII code is that each character has its own code combination including upper case and lower case letters. For example, in the Baudot Code a "4" and an upper case "R" share the same code combination and there is no lower case "r".

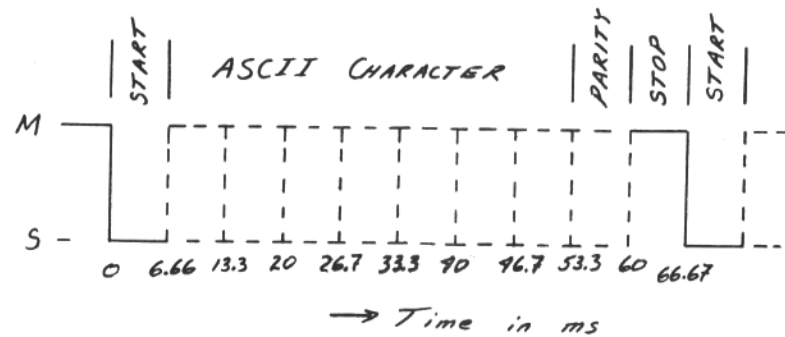
The interested reader is referred to the IT&T Handbook, 5th Ed., p. 30-44 for a complete listing of the ASCII code. (You should have a copy of this Handbook, whether you are interested in the ASCII code or not! "Reference Data for Radio Engineers", 5th Ed., 1968, Howard Sams, \$20 list.)

When used with Teletype machines, additional bits are required. The following figures show the format used for 100 and 150 WPM (Words per Minute)

Continued on Page 15



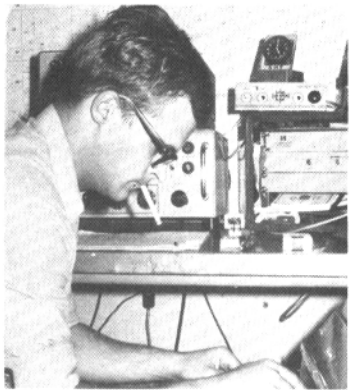
100 WPM FORMAT



150 WPM FORMAT

RTTY Faces Around The World -

How Many have you Worked ?



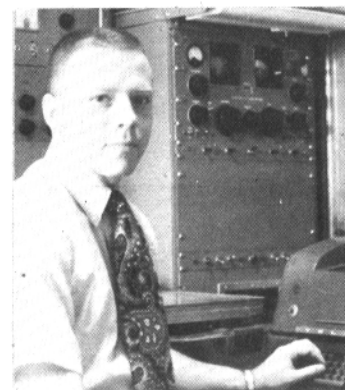
Kari- OH6TI



Ken- WA8ETX



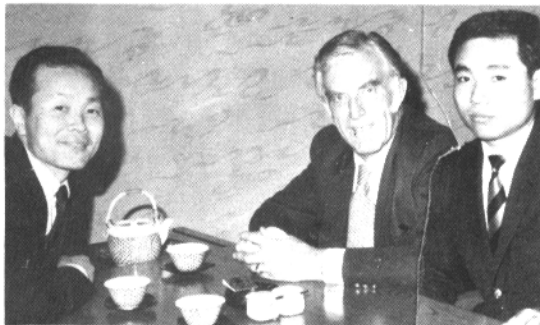
Rex- W4ZAG



Bob- WA4VYL



**Henri- LU2ESB
ex FO8BS**



**Ted- JA1FFX Aki- JA1EUL
Paul- KH6AG**



Dave- HL9KL



Mac- JA1ISF



Joe-DL2AK / C31FV



**Maury- K0SVT ED- W9IUU
Frank- W9YPS Cal- W9ZTK**



**Knobby- W2PLQ Bud- W2FLF
Paul- PY1DCB**



John- KL7GRF



**Gwen- VE3AYL VE3RTT
Alan- VE7LL**

RTTY-DX

JOHN POSSEHL - W3KV
Box 73 Blue Bell, Pa., 19422



Hello there

August was not a good month for Amateur Radio. In the first week there occurred a couple of Solar explosions that even the experts did not predict and which were said to be among the largest ever recorded. Radio propagation was at about zero for about two weeks and those of you that were away on vacation then could not have picked a better time, you did not miss a thing.

Conditions were just about starting back to normal for the SARTG Contest which took place in mid-August. Activity was good and all Continents were represented but propagation was quite variable and I guess it was pretty much as to where you were located as to what you thought of conditions. From here Europe is usually the best bet for contacts and multipliers but it did not work out that way this contest, not too many were even heard or printed. On the other hand, the far out areas like Asia, Africa, and Oceania, were booming in, but of course activity was quite scarce for filling up the log sheets. There were some very brief openings on Ten and they were mainly to the South and West but they must have been quite good between Europe and South America. We could print LU2ESB really working the European stations but could hear nothing of them here. We found 40 and 80 to be too noisy with Summer static and broadcast station QRM to make any DX contacts so as usual the main activity was on 15 and 20 meters. Some of the choice multipliers active in the Contest were, VK9GG, JA1BK, VU25KV, YA1OS, ZS3B, ZS6BBK, YN1CW, FM7AJ, HA5FE, LU2ECN, KL7GRF, KH6AG, KZ5LF, XE1YJ, VK4MJ, CE3EX, CR6CA. The Scandinavian stations of course counted for double points but due to the conditions as mentioned above, not very many were logged here.

The activity of C31FQ from Andorra was a rare multiplier for any Contest and the boys really appreciated the efforts of Paul, DJ5PN in getting that station on the air for the Contest weekend.
12 OCTOBER 1972

He was very active on most all bands and also a new country for practically everyone he worked.

QSL cards go to --

Paul Raiaer
Kriegerheim Str. 13
D56 Wuppertal 1
West Germany

Paul was active for a few days after the Contest and was soon followed by C31FV. This station was operated by Joe, DL2AK who also set up in Andorra and was active until about the 9th of September. He put in a terrific signal to the States and other areas from two Vee beams, four wavelengths to a leg on 14 mhz. At the time of our QSO with Joe we were suffering from very hot and humid weather here and Joe was up in the clouds freezing at 9000 feet altitude. Cards for C31FV go to --

Joe Thiele
Katernberger Str. 8
D 56 Wuppertal 1
West Germany

Be sure to include IRC's for return QSL and if you have worked DJ5PN and DL2AK from their home station in the past and have not yet QSLed. It might be advisable to include a QSL for those contacts also, you may get the Andorra card faster.

There is a new station QRV from Hungary, he is Jenó, HA5FA. Zoli, HA5FE, says to watch the call sign very carefully especially in Contests. I can recall the problems I have had in the past trying to keep HA5KBF and HA5KBF straight in a Contest. You know, the "we worked before" routine.

There have been quite a few new stations active from Japan recently all with excellent signals. In addition to JA1ACB, JA1FFX, and JA1MP, you will now also find JA1BK, JA7UZ, JA8JL, and JA8ADQ.

Jean, FM7AJ is again QRV after a bit of travelling around the Caribbean. He was on the British Virgin Islands and got VP2VV going on SSB, unfortunately no machine available. Jean says that he may get to St. Martin, FS7, for some

RTTY JOURNAL

RTTY activity in September or October so this will be one to watch for as there has been no RTTY activity from here for several years, the last time being FG7XT/FS7 in 1965. Also look for two new stations from Martinique, FM7AA and AB. Both have machines and should be ready to go QRV soon.

To up date some previously published information. Gin, JA1ACB informs us that the hoped for activity from Mongolia by JT0AE will not be possible at this time due to licensing difficulties. We have received no further information about 9K2CA due to be QRV around the beginning of September. Swan Island still a good possibility in the coming months. We received a letter from them recently and sent them a lot of info. They have the machine (28 ASR) and are working up to the TU/FSK. We'll keep you posted. We repeat again that those needing Korea might very well find that a blind call to KL9KL on 14075, narrow shift, will bring a response. Dave has that frequency monitored 24 hours a day with a receiver and printer.

Congratulations go the following stations this month upon receiving the WAC Certificate.

Nr. 198 Ed DeYoung KH6GLU
Nr. 199 Yates Holleman W4ZLH
Nr. 200 Chuck Barrows K7BVT

Certificate Nr. 200 marks something of a milestone for the WAC Award. The records show that Nr. 1 was issued to VE7KX in 1960 and about a total of 6 certificates were issued that year. This year so far, with four months to go at this writing, a total of 20 have been issued.

Before you receive the next issue the CARTG "Maple Leaf" SS will be history. From the way the past few contests have been going, this one may very well be the first all "Narrow Shift" Contest. Get the gear in shape NOW!!

Late FLASH news from DL8VX-- HB9P and HB9AKA will operate on RTTY from HV3SJ, Vatican City, during the CARTG contest.

F9RC still plans operation on Channel Islands- no definite day as yet.

*** 73 de John

CARTG 12th RTTY 'Maple Leaf' Sweepstakes-

OCT. 14--16
ZONE SCORING CHART PAGE 16-
RULES- See SEPTEMBER ISSUE

RTTY JOURNAL

YAESU EXCITER on RTTY

BRUCE BALLO, VE2QO
BOX 392
MONTREAL INT'L AIRPORT
Quebec, Canada

With the thought that it may help others using the Yaesu FT DX 400 (Ed. note: I believe the FT 400 is similar to the FT DX 560 sold in the states) I am enclosing modifications and ideas that have worked fine for me on RTTY.

I am using a modified AK-1 AFSK generator and feeding it directly to the mic jack. The mic gain MUST be kept low to prevent overdriving the transmitter. Final PA current (meter switch in I.C. position) is 200 mils maximum. PA final voltage is 800 volts with a cooling fan on the finals.

Using narrow shift tones of 2125-2295 no modifications are needed on the FT 400 for receiving. The use of the CW filter is a definite advantage on narrow shift and may be used on the LSB position by simply wiring the filter so it is in the circuit on the LSB position. The two tones are centered within the CW filter. Use of the clarifier is handy when the signal is drifting.

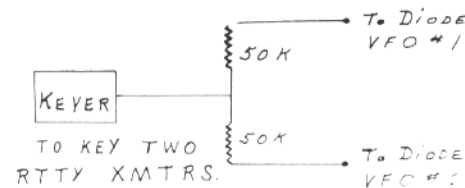
For use on wide shift tones of 2125-2975 the 3181.5 Hz crystal should be changed to 3182.5 to allow the 2975 tone through. (This crystal is available from Jan.) The CW filter cannot be used on wide shift, the regular SSB filter is used. Since the trend is to narrow shift no modifications except wiring the CW filter to the LSB position if you stay on narrow shift.

Remember that any exciter using sweep tubes in the final must be run at a very conservative input and if this is followed no problems using this exciter should arise. Keep the drive DOWN.

*** SWITCHING FSK --

If you want to FSK two or more transmitters with VFO diode shifting from the same keyboard unit without either affecting the other ... insert about a 50k resistor in series with each outgoing vfo line.

Vernon Dillaplain W5E00





This issue reaches you about the opening of the winter activity on the ham bands. The CARTG DX contest, one of the best of the season is in October - cooler weather means less noise on the lower frequencies, inclement weather gives more time to finishing all the projects that have been started and lying on the bench for lack of desire to work while there were so many other things to do, nets will be more active and once again RTTY will pick up in all phases. For us there is only one drawback - football TV broadcasting also starts and goes on and on and on. This year we have promised ourself to cut down on watching -- egad but we have wasted a lot of time in the past. Even with being retired there always seems something we want to do and don't have the time. But I dunno- we are not especially strong willed so our weekerds may still be spent in front of the TV.

One thing still bothers us and unfortunately if you are reading this it probably doesn't apply to you - but it might in the future -- Every month we get from 2 to 5 copies of the Journal back from the post office marked - moved, left no address - party unknown - no such number, etc.

We try to track down the address if we have the call but many times can only pull the stencil and hope the party writes us and we can straighten things out. The poser is that in most cases the magazine has been delivered for several months before the notice of - no such address etc. is received. If you miss a copy let us know, we are always happy to send another, but a number of copies are returned that we never hear from. Kinda hurts our ego.

Our request for pix has been excellent, so good in fact that we are running a center spread gallery of good RTTYers. Sorry it can't be as exciting as the Play Boy center spread but at least you can communicate with some of our notables and how many of us ever get a chance to talk to a Bunny --

14 OCTOBER 1972

From The Editor
and
his Mail



BACK ISSUES

New subscriptions and classified ads are cash in advance as we have no method for billing. New subscriptions will be started with the current issue and one back issue, if requested. Please do not ask us to start any further back than this. Back issues - if available - may be ordered at 30c each at time of subscription. The JOURNAL is mailed about the 20th of the month preceding the dated month. May and June are a combined issue and July-August is a combined issue.

The ONLY back issues available are listed below. 30c each.

- 1966- Oct.- Nov.-Dec.- [3]
 1967- NONE-
 1968-March- [1]
 1969- Oct.- Nov.-Dec.- [3]
 1970- None.
 1971-Jan.-May-June-July-Sept.-
 Oct.-Nov.-Dec.- [8].
 1972-Jan.-Feb.-March-April-May
 July-Sept.- [7].

[May-June] - [July-August] are combined issues.

RTTY JOURNAL
Box 837
Royal Oak, Mich. 48068
 Editor & Publisher - 'Dusty' Dunn, W8CQ

SUBSCRIPTION RATES

U.S. Canada- Mexico	1st Class	\$3.00
	Air Mail	\$3.50
Other Countries	Surface Mail	\$3.50
	AirMail South-Central America	\$5.50
	Air Mail . . . All Other Countries	\$6.00

RTTY JOURNAL

THEORY & APP.-

Continued from Page 9

operation. Each complete character is composed of a Start pulse (always a Space), 7 bits which are Marks or Spaces conforming to the ASCII code given in the Table, a parity pulse which is either a Mark or Space, and a Stop pulse which is always a Mark.

For 100 WPM operation, the code could be called an 11-unit code, because it has 11 time intervals 9.09 milliseconds long. The Stop pulse is composed of two 9.09 ms Marks (or one 18.18 ms Mark). The Teletype Corp. M33 and M35 machines operate at 100 WPM using this format. For 150 WPM operation, the format is the same as it is for 100 WPM operation except that the Stop pulse is one unit long; the units are all 6.667 ms long. The 150 WPM code could be called a 10 unit code. The Teletype Corp. M37 operates at 150 WPM using this format.

Both the 100- and 150-WPM codes are called 8-unit or 8-level codes although they are 11 or 10 units long and carry only 7 bits of information!

An obvious question at this point is: Can an existing machine be converted to ASCII (8-level) operation? There are two answers: 1) Some M28 machines were converted but apparently it was considered too costly and it is better to junk the older machines and replace them with new M33, 35, and 37. (See the letter in this column last month.) 2) Build an electronic converter. The basic conversion of Baudot to ASCII (and the reverse) should be easy. However there are two problems: 1) A Baudot machine requires shifts; this would require generating LTRS and FIGS when receiving and thus some buffering or storage which would affect the speed of operation. Perhaps the shifts could be introduced into the receiving machine via a separate path. 2) The receiving Baudot machine would have to operate at a higher speed than the transmitting ASCII machine. Again, a separate shift path into the receiving machine might resolve this problem. Of course, if the incoming ASCII signal were stored on tape (punched 8-level or magnetic), then speed conversion would not be a great problem. If anyone has information on code conversion for receiving ASCII on a Baudot machine, we would like to see it. The reverse situation, conversion from Baudot to ASCII should be much easier, but of no great interest to the amateur since it is illegal for amateurs to use the modern ASCII code

RTTY JOURNAL

on the amateur bands. This leads to some strong personal feelings which won't be aired here.

73 ES CUL, RG

HQ215 Modification--

Continued from Page 7

cient" ceramic capacitors. Dipped micas are little better. Try to use the "stabilized silver micas" preferably those called half postage stamp size. El Menco E1011 100 pf is an example. Also Cornell Dubiler 22R5T13 would be another 130 pf and Sangamo CM20-E102J03 a .001 that is satisfactory. 5% tolerance is ample for any of these circuits.

Transistors are another "gray area" The most stable ones so far have been the Motorola 2N706A. Their stability is usually half an order (5X) better than others. If you wish to try, Fairchild has a 2N706A at .43 each.

Following the oscillator with an emitter follower seems to help isolate the following circuits from the oscillator.

A good oscillator of this type has an unlimited number of uses.

For maximum stability an International HA crystal is suggested and a 32 pfd load specified. They have the circuit of this oscillator and do an excellent job of hitting the frequency. The commercial grade of crystal is also perfectly adequate and a little cheaper.

Remember that the 2N706A will oscillate up to 400 mc at the drop of a thought so be sure to put the 27 ohm emitter resistor in carefully and as close to the transistor as possible.

I am using the same oscillator in the SS-1 Solid state exciter and in both HQ-215's. Possibly some of the fellows can benefit from the drift work done.

NOTE A: The 452.850 is an LSB crystal for RTTY. The variable BFO is still intact and can be used if upper sideband or off frequency by up to 1kc RTTY signals need to be copied. This crystal varies in frequency with the filter used and should be set for the filter passband. A nominal figure for all filters appears to be 452.800 kc. All you do is set the tones for normal use and measure the BFO with a counter.

*
*
*
*

OCTOBER 1972 15



Freeman'

KH6AX

Anyone that has worked RTTY on 15 or 20 meters has no doubt talked to Freeman, KH6AX many times. Freeman's activity is not limited to RTTY and may be found on fone or CW almost any day. What you may not have known is that Freeman is a young squirt of 76 with 64 years of radio operating experience behind him. And what experiences.

Here is a man who doesn't live on his memories of a very useful and active life. He thoroughly enjoys the opportunities to be of genuine service with his short wave equipment and at the teletype where he rattles off 100 words per minute daily, "conversing" with life-long friends on the mainland.

His 64 years active radio operating places him among the elite members of the Society of Wireless Pioneers. He holds all radio licenses, commercial and amateur, issued by the Federal Communications Commission. His colorful career has included being a radio operator for the U.S. Navy, the merchant fleet, such as the Luckenbach Line. He holds a master's license for any and every ocean.

Yachtsmen, of course, know Lang as a true friend, and not just because he is a bonded yacht broker located at the Ala Wai Yacht Harbor. For 22 years he handled communications for the Trans-Pacific Yacht Races, and for the last couple of races he served as No. 2 man.

One of the more exciting phases of Lang's life occurred in the 1915 revolution in Haiti with the Marine Corps. He still carries a memento on that fracas, a 25-caliber bullet lodged in his left elbow.

A resident of Honolulu since 1936, Lang pioneered in the early days of radio broadcasting. It was around 1921 when the first Los Angeles stations went on the air, KHJ, and KFI. He worked on KHJ, owned by the Los Angeles Times, but subsequently he was one of the original "pirates" with his own station, long before the old Federal Radio Commission got around to granting licenses. In those days anyone could choose a frequency and call letters and go in business. Lang chose KRLO, because it didn't sound like any other letters and were not likely to be mistaken for any others.

He had his studios on Larcnmont Boulevard. He didn't have any set programs but would just talk and hold a microphone in front of an acoustic phonograph and play records.

Lang was a Hollywood celebrity in the '20's and early 30's and in great demand as a master of ceremonies for such events as the opening of Grauman's Chinese Theatre (with 'King of Kings'), and the weekly broadcasts of the Los Angeles and Glendale Breakfast Clubs. He did a popular series of 5-minute narratives called "Here and There with Freeman Lang," detailing his experiences with famous personalities of the day in show business, aviation, sports and the business world. He was easily the top-ranked radio personality in Southern California for a number of years until the lure of Hawaii called.

One of the feats Lang likes to recall was the first broadcast from a blimp flying over Los Angeles and Santa Monica, using a home made lightweight set because the blimp could not stand much weight.

That was a far cry from his first radio station in Southern California where he operated, sending and receiving, from a set made from a second-hand key, coils from an old doorbell, and an old type telephone receiver. For antenna he used a high chicken wire fence in the back yard of his home. He became proficient in both American Morse and International Telegraph Codes, and later when he enlisted in the Marines, he was made an instructor at the Philadelphia electrical school.

Literally thousands of individuals know Freeman for his unselfish efforts and we thought a number of our readers would be interested in some of his background. Work him -- and ask for one of his "South Sea Island Maidens" - he is as generous with them as his help on other things.

YOUR zone		ZONE POINT TABLE for SCORING																																							
40	15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
39	14	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
38	13	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
37	12	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
36	11	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40				
35	10	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40					
34	9	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40						
33	8	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40							
32	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40								
31	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40									
30	5	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40										
29	4	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40											
28	3	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40												
27	2	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40													
26	1	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40														
25	1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40															
24	1	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																
23	1	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																	
22	1	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																		
21	1	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																			
20	1	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																				
19	1	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																					
18	1	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																						
17	1	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																							
16	1	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																								
15	1	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																									
14	1	27	28	29	30	31	32	33	34	35	36	37	38	39	40																										
13	1	28	29	30	31	32	33	34	35	36	37	38	39	40																											
12	1	29	30	31	32	33	34	35	36	37	38	39	40																												
11	1	30	31	32	33	34	35	36	37	38	39	40																													
10	1	31	32	33	34	35	36	37	38	39	40																														
9	1	32	33	34	35	36	37	38	39	40																															
8	1	33	34	35	36	37	38	39	40																																
7	1	34	35	36	37	38	39	40																																	
6	1	35	36	37	38	39	40																																		
5	1	36	37	38	39	40																																			
4	1	37	38	39	40																																				
3	1	38	39	40																																					
2	1	39	40																																						
1	1	40																																							

CORRESPONDENT zone Zone Chart Courtesy SSB & RTTY Club Italy

Classified Ads- Rates-\$1.- 30words. ADDITIONAL Words 3¢ ea.
CLOSING DATE FOR ADS- 1st of month.....

NEW HAM MAGAZINE!! Interested in public services, humanitarian actions and international friendship? Sample issue free. Published every three weeks. Worldradio, 2509 Donner Way, Sacramento, Calif. 95818 WB6AUH

MORE RTTY! THAT'S RIGHT. In 1970 there were more feature RTTY articles in HAM RADIO Magazine than any other general amateur magazine. You need RTTY Journal, but you need HAM RADIO also. \$6.00 per year; \$12.00, 3 years. Ham Radio, Greenville, N.H. 03048

BACK ISSUES OF RTTY JOURNAL - I have a complete file of all issues from Vol. 1 No. 1 to date. Will reproduce any issue for \$1.10 pp. Add 25¢ for air mail delivery. John Isaacs, 3175 Val Verde Ave., Long Beach, CA. 90808.

"RTTY SPEED CONVERTER" A drilled, fiberglass 4" x 6-1/2" printed circuit board now available for the WA6JYJ speed converter in the DEC 71 issue of HAM RADIO. \$6.00 postpaid. Complete parts kit including PCB, \$40.00, postpaid. P & M Electronics, 519 South Austin, Seattle, WA 98108. (41 words)

11/16" PERFORATOR TAPE, 40 roll case - \$7.95. Sprocket feed paper, \$3 per box (FOB). "Teletype Equipment, Supplies and Information for the Radio Amateur." FREE LIST. BVE, POB 73-R, Paramus, NJ 07652.

"AFSK GENERATOR" - PCB and all components except input output jacks, power supply and chassis. \$6.60. P & M Electronics, Inc. 519 South Austin, Seattle, WA 98108 (23 words)

TYPEWRITER RIBBON RE-INKER: Hand operated model now only \$3.50. K575 or K764 ink available at all National Cash Register Stores. 75¢ per tube. Walter Nettles, W7ARS, 8355 Tanque Verde Rd. Tucson, AR. 85715.

BUYING? SELLING? TRADING? Don't make a move until you've seen our new publication. Free sample copy! Six issues \$1. HAM ADS. P.O. BOX 46-653J, L.A., Cal. 90046.

HAL COMMUNICATIONS CORP: HEADQUARTERS for MAINLINE Solid State RTTY equipment. You can do no better than the ST-6 demodulator at any price. Screened, punched cabinets for the ST-6 now available. For budget TTY, its the ST-5 for HF or VHF. And the best in AFSK is provided by the AK-1. Our new model 1550 electronic keyer, or the MKB-1 Morse Keyboard, will automatically identify your RTTY station at the push of a button. The extra values are available from HAL Communications Corp., Box 365RJ, Urbana, IL 61801. Phone: 217-359-7373.

GEAR SETS: for model 14 TDs. Sync 1800 RPM, 60WPM felt clutch, unused \$5.00 set. Gear sets (2) for model 14 reperf, sync 1800 RPM 60 WPM, used excellent \$4.50 per set. Teletype sprocket wrench 5/16 with 12" long handle unused \$1.00 each. Tuning fork; 120VPS unused. \$2.00 each. Atlantic Surplus Sales, 580 3rd Ave., Brooklyn, N.Y. 11215.

START PACKING! Plane or R.R. tickets, roadmaps. Got 'em? Then you're ready to take off for the gala ARRL Hudson Division Convention, Oct. 21-22, Hilton Motor Inn, Tarrytown, N.Y. Plenty of Free Parking. Exhibits, 2-meter FM, RTTY, lectures, contests, YL-XYL events, gabfests, N.Y. City sight-seeing. Prominent Banquet Speaker. All ya need to know from Dave Popkin, WA2CCF, 303 Tenafly Road, Englewood, N.J. 07631. Free gifts for early registrants.

WANTED: TELETYPE MACHINES - Model 15 and 32 in large quantities. In good condition for use by deaf people. Will accept donations or pay fair prices. Can be picked up anywhere - Lee Brody, N.Y.-N.J. phone TTY for the Deaf. 201-796-5414 evenings. 15-06 Radburn Rd., Fair Lawn, N.J. 07410.

TYPETRONICS NEEDS YOUR unused surplus teletype parts. M 14-15- & 19 as well as M 28 and later. Please write what you have and asking price, cash or trade, to Fred Schmidt, W4NYF, Typetronics, Box 8873, Ft. Lauderdale, FL. 33310.

GOING OUT OF BUSINESS: Loads and loads of teletype and electronic "steals". Bring your truck or station wagon, wheelbarrow or lug it on your back; but come out. Facsimile machines, Deskfax units for sending and receiving. Loaded with tubes, optics, motors, relays, switches, etc. Operable and ONLY \$9.00 each cash and carry - COME & GET EM WHILE THEY LAST. C.B. GOODMAN & CO. 5826 South Western Avenue, Chicago, Illinois 60636. Phone: 312-476-8200.

PHONETYPING TERMINAL UNIT - MARK III, ACOUSTIC COUPLER, for use to operate teletypewriter, using a regular telephone. Highly reliable circuitry, thousands in use by deaf people nationwide. Automatic power switch, visual monitor light, self-contained unit ready to drive keyboard, magnet, and motor lines. \$134.50 FOB. Send for brochure. R.H. Weibrecht, W6NRM, APPLIED COMMUNICATIONS CORP., P.O. Box 555, Belmont, Calif. 94002.

TOROIDS, 88mm. UNCASED - 5/\$1.50 pp. W9FTE, Dick Sanborn, 8800 W. Cloverbrook Ct., Milwaukee, Wisc. 53224.

ESSCO COMMUNICATIONS INC. Announces availability of a phone-TTY modem....anacoustical coupler ATC-3 which when connected to a teleprinter and an ordinary telephone enables you to communicate with the printed words with another similar coupler. Used by deaf people nationwide. Compatible with other modems in deaf network. ESSCO ATC-3 is only \$129.95 FOB. ESSCO Communications Inc., 150 Marlton Ave., Camden, N.J. 08105. Phone 609-365-6171.

HAL COMMUNICATIONS CORP: Announces the revolutionary new RVD-1002 and RKB-1 solid state RTTY system. Provides the ultimate in noiseless, reliable reception and transmission of Baudot coded TTY. The RVD-1002 visual display system receives demodulated TTY pulses from the ST-6 and provides video output to a video monitor, or modified TV set. One thousand (1000) characters are displayed in a 20 line, 50 character per line format, at 60, 66, 75, and 100 WPM if your TU will copy it. The RKB-1 combines reliable TTL circuitry, a high quality commercial keyboard, and a rugged case to provide the best Baudot TTY keyboard available. The electronics is arranged so that you type as if you were using a typewriter. See them on display at the Peoria, Findlay, and Cincinnati hamfests. Get the details from HAL Communications Corp., Box 365RJ, Urbana, IL 61801. Phone 217-359-7373.

SALE: SYNCHRONOUS MOTOKS for Mite teletypewriter, unused 115AC 60 Hz. 1 ph. \$20.00 Each. For model 28ASR LML 12, used excellent, \$13.50 each. Parts, unused, for model 14, 15, 19, 28 Kleinschmidt and Mite parts, also gears. Model 14 typing reperf complete with retakner and end of line indicator, keyboard, cover and synchronous motor, Excellent, \$35.00 each. Atlantic Surplus Sales, 580 3rd Ave., Brooklyn, N.Y. 11215.

FOR SALE: TELETYPE MODIFICATION KIT 159417, Three speed gear shift (60-75-100) for single shaft Model 28 reperf (typing or non-typing). This is the type that mounts in the small, separate one foot square box. It can also be used to convert the Navy Model T-192 Reperf from 65-71-106 WPM to standard speeds: \$50.00. I also have single shaft reperf assembly with the selector assembly and range finder missing. The typing mechanism can be removed and installed on the standard non-typing reperf in the 28ASR to permit printing on the tape as it is punched. \$25.00 Briefcase telephone. Free installation in automobile of Southern California buyer. Cost \$1700 two years ago. \$450. Tektronix 541A with CA Plug-in: \$595. Singermetrics Spectrum Analyzer SB-15: \$295. Panoramic Radio SB-8B Spectrum Analyzer: \$125. Hank Scharfe, W6SKC, 1015 Fremont Avenue, South Pasadena, California 91030. 213-799-5886 or 213-682-3705.

FOR SALE - WESTERN ELECTRIC 164C1 teletype transmission measuring set Military TS-785A/GG new with manual. Reads distortion and bias on scope 60 - 75 - 100 speed and 60 - 20 ma or polar operation 5 or 6 level code. Complete with cords in original box, price \$35.00 FOB. Charles V. Berlin W6JJC, 713 Trevethan Avenue, Santa Cruz, Calif. 95060.

TECHNICAL MANUAL for Model 14 TeeDee, that long searched for complete description, adjustment, lubrication and parts book all in one for just \$2.25 Postpaid. BVE Enterprises, "Communications Equipment, Supplies and Information for the Radio Amateur", POB 73, Paramus, NJ 07652. (Send for free list of other goods.)

WANTED--TELETYPEWRITERS--All makes, all models, any condition. Cash available. Vardon & Associates, 930 N. Bellline, Suite 140, Irving, Texas 75062. (214)252-7502.

DOVETRON TELEPRINTER SPEED CONTROLLER. The DOVETRON TSC-1000 Teleprinter Speed Controller is an all-electronic, solid-state synchronous motor controller that functions as an electronic "gear-shift" by varying the frequency and amplitude of the motor driving voltage, permitting a teleprinter to send and receive at any speed between 50 and 120 WPM. A five position front-panel switch permits instant selection of 60-67-75-90-100 WPM operation, provided the teleprinter is equipped with 100 WPM gears and a 50 or 60 Hz synchronous motor. A second front-panel control permits (1) electronic range-finding, (2) synchronization of the teleprinter to the exact speed of an incoming signal, and (3) copy of any speed between 50 and 120 WPM. The teleprinter automatically sends at the same speed at which it is receiving. Useable on any line frequency between 40 and 400 Hz, the TSC-1000 permits stable speed operation on power mains with fluctuating frequency and amplitude. Although designed specifically for use with the 28KSR/28ASR, the TSC works equally well with other Model 28 devices, the Models 32, 32, 35 & 37, the Kleinschmidt TT-100 and Mite Midgears. Input: 115 vac -10%, 40-400 Hz. Size: 8" H x 8" W x 11" D. Weight: 17 pounds. Price: \$129.50 FOB South Pasadena. Your QSL will bring complete specifications. DOVETRON, 1015 Fremont Avenue (Box 267), South Pasadena, California 91030 (213-682-3705).

SALE: MODEL 19, \$100. Model 15, \$50. Model 26, \$20. Model 14 reperf, \$35. Model 14 TD, \$25. Spare parts for 14, 15 and 19 worth \$8,000 for \$8.00. Polar relays new, \$1.25. Platten cranks for 15-19, \$1.50. Have much more, what do you need? Dick Steele, K6AZE, 6551 Dume Drive, Malibu, CA. 90265. 457-2269.

WANTED - FOR USE BY DEAF PEOPLE - TELETYPE MACHINES Model 15-19-26-28-32. Must be in reasonable condition, complete with keyboards. Can pick up anywhere. Send information to R.H. Weibrecht, W6NRM, P.O. Box 555, Belmont, Calif. 94002.

TOROIDS: 88 or 44mhy. 30/\$10. POSTPAID (\$2.50). Ribbons for 14, 15, 19, 28, 32, 33, Mite, Lorenz-black nylon 12/\$3.50 postpaid. 60 speed gears for model 15-19 (74912-74913) \$3.50/set. 11/16" tape-fresh - \$8/case/40 rolls. Sprocket feed paper for all models \$5.00/box. Single copy roll paper (8-1/2") NEW \$12.50/case/12. Late model 28 typing units, excellent \$175. New cover for model 14 reperf \$10. DESK FAX 6500 Tranceiver \$15 (2/\$25.) plus paper \$3/pkg. Manual for TXC-1 FAX \$7.50 postpaid. Stamp for picture catalog. Van's W2DLT Electronics 302R Passaic, Stirling, N.J. 07980.

R-390 A/URR EXCELLENT CONDITION \$595. Will consider #28 or #33 Teletype in part trade. Alltronic-Howard Co. Box 19, Boston, Mass. 02101. (617-742-0048)

HAL COMMUNICATIONS CORP: ONE SOURCE FOR ALL your construction needs. Our line of resistors, capacitors, and semiconductors will fill your requirements for practically any project. TTL devices are stocked in volume to support production of our keyers, identifiers, and the fantastic RVD-1002 RTTY Visual Display Systems. Fast service at reasonable prices. HAL COMMUNICATIONS CORP. Box 365RJ, Urbana, IL 61801. Phone: 217-359-7373.

TTL SELCAL DRILLED FIBERGLASS P.C. BOARD. See RTTY JOURNAL December 1971, double sided, solder coated. Instructions included. \$15.00 each. K7WJC, Louis Staalberg, 7234 East Papago Dr., Scottsdale, AR. 85257.

FM MOTOROLA SCHEMATIC DIGEST - 136 giant pages 11-1/2x17 schematic diagrams, alignment instructions, crystal information, trouble shooting information. \$6.50 postpaid. S.M. Wolf, PO Box 535, Lexington, Mass. 02173

WANTED TO BORROW World's best TU for copying narrow shift through thermal noise. Objective: To print moon echoes on 2304 MHz. K4RJ (exW3GKP) Rt 7 Box 315, Franklin, NC 28734.

MODEL 28ASR - Complete, working like new. \$1,100 4 freq Prog line w/TT/L Junior and afsk. \$200. SASE for info. WA8SEL, 18704 Glastonbury Rd., Detroit, Mi. 48219

MODEL 33ASR WITH STAND; clean, works good on all functions. Originally in TWX service; write or phone J. Salter, K5BQA, 11040 Creekmere, Dallas, Tx. 75218 (214-328-1221).

MODEL 28 GEARS - All like new and ppd., 67 or 75 WPM set \$4.00, 60 or 100 WPM set \$7.00. WA3KDJ, P.O. Box 204, West Newton, PA. 15089.

BUILD OR BUY - AUTOSTART automatically turns tly machine on and off. Great for MARS net operation. Will not respond to voice or tones outside the 2125hz space tone passband. Hooks to speaker. PC board 2.50, wired 17.50 AFSK-2 TU-Dual output to directly drive two TTY machines or a TTY and reperf. Current limited transistor switches (60ma), input bandpass filter, tuning meter or scope connections, 850 and 170hz shift. PCboard 4.00 wired 49.50 TU-3

AFSK OSCILLATOR - Two oscillator's gated for no phase distortion during switching. Keyboard input buffered for long line noise immunity. PC board 3.00 wired 29.50 AFSK-2
SEND SASE for schematics and info PC Electronics W6ORG 10253 E Nadine St., Temple City, CA 91780.

Additional Classified page 20.