RTTY *Journal*

EXCLUSIVELY AMATEUR RADIOTELETYPE

4U1ITU crew operating European DX contest
l to r: DF7FB, DJ1QT, HB9AVK, DJ8BT and DF6ZY

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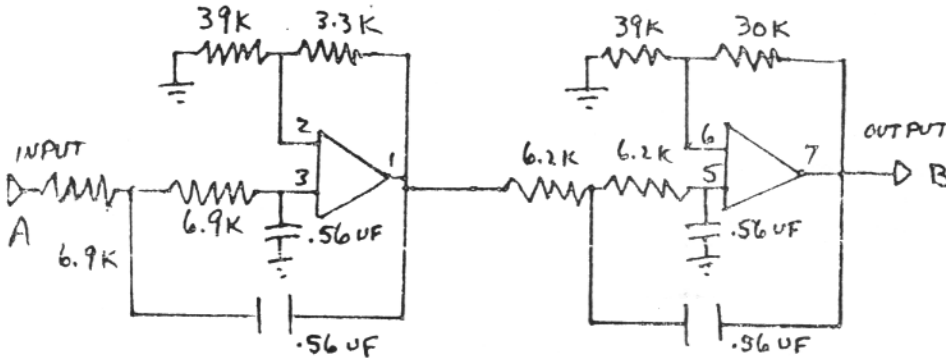
VHF RTTY NEWS
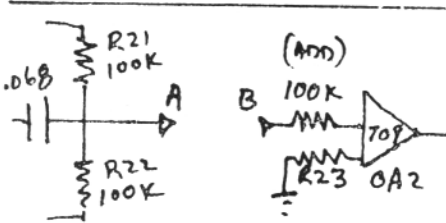
Arny Gamson, K6PXA, 8034 Gentry

N. Hollywood, CA 91605

I have seen a lot of interest in computers and computer articles which are becoming more and more popular in RTTY. For this month's column I have presented my favorite computer and digital articles.
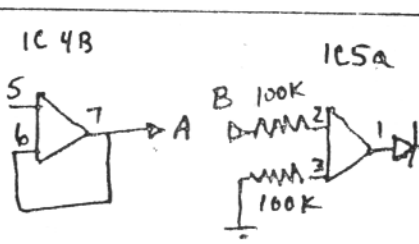
30 HZ (3db) BISSEL LOW PASS FILTER "Scatter" Optimized for 45 baud "60 speed use using a single 1458 dual op-amp

Insertion into ST-5

Insertion into DM-170 Disconnect the C24/R45 R46/D7/D8 etc. of the ac coupling system and direct couple!

1. Check output voltage at pin 7 with full mark and space to be sure that it is not saturating — the circuit has a voltage gain of 2 (approx.). If output swings to more than three fourths of the supply voltage, use a voltage divider on the input "A" to get the dynamic swing at "B" lower.

2. for optimized use with ascii at 110 or 100 sp. baudot, the four capacitors may be changed to 15mfd. while resistors remain the same.

3. If using the DM-170 TU, consider removing the AC coupling on the slicer stage. This generates increased errors that depend on the prior characters that have just been received and where they left the instantaneous charge on the coupling capacitor (even if you don't add the lowpass).

MIKE MOORE- N7RY
SO. COUNTRIES AMATEUR
TELEPRINTER SOC.(CA.)

COMPUTER TALK

Computerniks are a funny sort of people, using all sorts of funny words and expressions. In this article we will try and familarize the reader with some of them so that the next time that you hear one you will know what they are talking about.

ASCII-(Pronounced ASKEY) — This word is a shortened version of the term "American Standard Code for Information Interchange" and is the computer equilivent of the familar Baudot code. ASCII is the offical language of almost all computers. RAM, ROM, PROM, EPROM are all devices that act as memory. They differ in how they program. The RAM is a Random Acess Memory that can receive and store data as well as release the data for use by the computer. Data within a RAM can be changed by the computer. On the other hand the ROM is a Read Only Memory that has its data programmed into it during manufacture. The data in this type of memory can only be released to the computer but not changed. The PROM is the same as a ROM except that the programming takes place after it is made. This makes it a Programmable Read Only Memory. The programming is done by the user and once it is done cannot be changed. The EPROM follows in the steps of the PROM except that if you change your mind the EPROM can be Erased by exposing the wafer to ultraviolet light. When exposed the EPROM forgets everything and needs to be reprogrammed again before use.

BYTE — (Pronounced Bite) — This thing called a byte is a 'word' to a computer. All words that a computer reconizes are of a fixed length. A BIT is what Bytes are made of in the same manner that letters are what words are made of. Most home computers use bytes that are 8 bits long (words that are 8 letters long). FLOPPY, DISC, DISK or FLOPPY DISK — No Virginia these are not words describing a limp Frizbee. These phrases all refer to a medium for mass data sotwage. A disk is a record shaped device made from magnetic material similar to that recording tape. It has the ability to store many thousand bytes of information and retreive them in milli-seconds. The disk along with its companion drive is a valued addition to the home computer. SOFTWARE — This term is synonymous with PROGRAM. They are both a series of commands that the computer executes to achieve a particular end. HARDWARE — This is the nuts and bolts of the computer and all its equipment. It includes things like power supplies, keyboards and the like. FIRMWARE is a combination of both; it is programs that have been programmed into ROMs (remember what a ROM is?)

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GETTINGSTARTED

RTTY is one of those quickly growing "specialized" forms of Amateur communications. The attraction to its devotees is probably a mixture of the magic of modern digital communications coupled with the convenience of written rather than coded or voice communications. If you participate in the popular autostart nets, it's not even necessary to be home when receiving a RTTY message — the printer will record the text for you to read at your convenience. RTTY is very popular among "rag-chewers" and "engineers" alike; in fact, you get to do a bit of both. The rapid growth of digital electronics has carried over to both RTTY and the new home computer hobby. ASCII communications between ham computers lacks only final FCC approval.

What do I need to work RTTY? A ham RTTY station need a transmitter, receiver, and an antenna just like any RF communications system, in addition to some "special boxes" to make the RTTY part work.

Receiver-Transmitter: The RTTY receiver and transmitter (or transceiver) should be stable well calibrated, and capable of EXTENDED TRANSMITTER OPERATION. When you are transmitting RTTY, the full carrier is on for longer periods of time than for CW or SSB voice. So check your manual and manufacturer for RTTY specifications and, if in doubt, reduce transmitter power somewhat. For HF work, a good SSB rig in LSB mode works well with RTTY tones. Most VHF-FM transmitters work with RTTY, but avoid overloading the transmitter as mentioned above.

RTTY Demodulator: The demodulator connects to the receiver audio output and converts the RTTY tones to keying pulses to drive the terminal. The quality of your printed signal is determined more by demodulator performance than by any other portion of the system.

Tone Keyer: The tone keyer circuitry converts the keying pulses from your terminal keyboard into audio tones to drive the transmitter. Since this circuit is closely related to that of the demodulator, both are usually in the same cabinet.

Terminal: The terminal is the device that prints or displays the received signals while allowing you to type your transmitter message. The terminal is sometimes divided into a keyboard and a printer or display section which are entirely independent of each other. The terminal can be as simple as a surplus electromechanical TTY machine or as exotic as the microprocessor controlled solid state HAL DS-3000 KSR terminal.

What is this mark and space business? The RTTY signal from the terminal is a series of pulses. The Amateur Baudot RTTY signal has 7 possible pulses for each character typed or printed, each tranmitted one-after-another (serial). Each pulse can be either "ON" (current flow in the RTTY loop) which is called "MARK" or, 'OFF" (no current flow), the "SPACE" condition. To keep decoders synchronized, the first pulse of a character, the START pulse is always a MARK (current on). The second through sixth pulses can be either MARK or SPACE, depending upon the coding required for a character. The START and all five data pulses are the same length; the STOP pulse may be either equal to or longer than the others. The so-called computer ASCII code uses START and STOP pulses but has eight instead of five intermediate data pulses, thus allowing a greater number of characters to be encoded. Althought all machines use pulses, the MARK and SPACE pulse conditions are converted into MARK and SPACE audio tones for easy radio transmission.

What is the Difference between FSK and AFSK? Transmitting RTTY signals via radio could be done like Morse Code with on-off keying of the transmitter carrier. However, the interference received during off-times would give badly distorted printout. Rather, HF RTTY is transmitted with Frequency Shift Keying (FSK) so that the mark pulse condition corresponding to one radio frequency and the space to another. Amateur Radio convention has it that the mark radio frequency is higher than space and that the separation or "shift" of the signal is standardized at 170 Hz or 850 Hz. (425 Hz shift is also used by commercial RTTY stations) Most present-day Amateur RTTY use 170 Hz shift exclusively. The FSK signal is received with the BFO turned, on, giving two audio tones for the mark and space conditions. The audio tones are, in turn, detected in the demodulator and the resulting pulses drive the display or printer loop. Note that changing the transmitter or receiver frequency (on purpose or throught frequency drift) will change the audio output frequency to the demodulator. The HF system is therefore quite drift sensitive. Present HF equipment frequency stability is quite adequate for FSK RTTY, but it is only very recently that VHF equipment was available with similar stability. Therefore, VHF RTTY has traditionally been transmitted by first keying audio tones with the RTTY pulses and then using these tones as the audio modulation of an AM or FM VHF transmitter. This is called AFSK for Audio Frequency Shfit Keying. Current Amateur convention is to make the mark audio frequency lower than the space frequency by the amount of the shift. Since the RTTY data is audio modulation of the carrier, frequency drift of either transmitter or receiver is a lot less critical. The audio frequency of the tones transmitted is set to be the same as those in the receive demodulator.
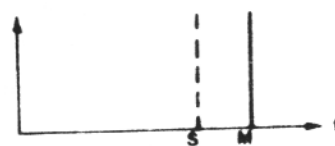
FSK RTTY
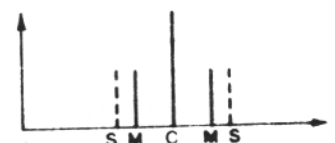
AFSK RTTY (AM)

What Frequencies do I use for RTTY? HF RTTY operation has evolved to heavy operation on the 80 and 20 meter CW segments with sporadic operation on other HF bands. 80 meter RTTY stations tend to operate between 3600 and 3650 kHz and 20 meter stations between 14.075 and 14.100 MHz. 170 Hz shift is used almost exclusively with the mark being the higher radio frequency. 60 wpm (45 baud) is the most popular RTTY speed, but 100 wpm (74 baud) is gaining in popularity.

Who do I talk to on RTTY? RTTY enthusiasts run the full range of ages and interests, but tend to be tecnically inclined. The typical RTTY'er is alway modifying his station, likes to talk, and usually has more ideas than you have printer paper (or display screen)! Recently, the home computer hobby has become quite popular with RTTY people and you may find a lot of help in debugging your programs if that's your interest. There are an increasing number of DX stations on HF RTTY.

To Arnie K6PXA   Got-Well Wishes   From the RTTY gang

I have compiled a list of Exclusive RTTY Clubs, most with Newsletters and Repeaters. Have also listed the voice Repeaters which share RTTY. Please advise of any corrections or additions.

San Diego Teleprinter Society
C/O Kat Goodman LOCAL LOOP
1057 Moana Dr.
San Diego, Ca. 92107
    223.22/224.82

So. Counties Am. Tele. Soc.
C/O Dale Sinner-W6IWO SCATTER
9085 La Casita Av.
Fountain Valley, Ca. 92708
    146.10/70

Portland RTTY Society
C/O Ted Peterson-W7WWG F1
P.O. Box 10672
Portland, Oregon 97210
    147.78/18

BI State VHF Tele. Soc. (Newsletter)
C/O Mike Stone-WB6QCD
804 Jefferson Av.
Lowden, Iowa 52255
    146.10/70

Radio Amateur Tele Soc. (Nwsltr.)
C/O Gary Buda-WA0NDN
17251 W. 67th St. ci.
Eden Prairie, Minn. 55344
    146.10/70

Denver A R Tele. Soc. and
Metro Amateur FM-RTTY Club
C/O Jim Labo-K0OST FM RTTY NEWS
6359 S. Fenton Ct.
Littleton, Colorado 80123
    442.2/449.2

Chicago A R TTY Rptr. System Grp.
C/O Sherman Klausner-K9BLX
3150 Des Plaines Av.-Suite 15
Des Plaines, Ill. 60018
    146.10/70

Canadian A R TTY Group-VE3RTT-RTTY NEWS
85 Fifeshire Rd.
Willowdale, Ontario,M21 2GP

British Amateur Radio Tele. Grp.
C/O Ted Double-G8GDW BARTG NEWS
89 Linden Gardens, Enfield,
Middlesex England EN1 4DX
    433.3 tx/434.9 rx

Australian Nat'l. A R Tele. Soc.-AREWISE
C/O W.I.C. 14 Atchison St.
Crows Nest N.S.W. 2065
Australia

Follows shared Repeaters (voice & RTTY);

Am. Comm. Society	San Francisco Bay	147.93/33
✱✱ Baltimore Radio Am. T.V. Soc.	Maryland	147.63/03 .
Black Forest Mtn.	Aurora, Colorado	146.19/79
Insurance City A R C	Burlington, Conn.	147.75/15
Cheyenne Mtn. A R C	Colorado	147.945/345
Dallas A R C	Dallas, Texas	146.10/70
Kenniwick	Washington state	147.78/18
✱✱✱ So. Counties A R Assn.	New Haven, Conneticut	147.855/255
Palos Verdes	California	144.76/145.36
British Columbia Tele. Grp.	Vancouver, B.C.	146.10/70

Is there a VHF-Technical Editor out there who would like to take my place and do as good or probably better? Please let me hear from you.
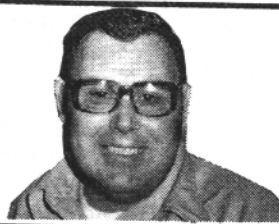
✱ A R R & D Corp. AMRAD	Washington D.C. area	147.81/21
✱✱ RCA (Corp.) A R C	Indianapolis, Indiana	146.28/88

************************************   *C U Enjoy*

Army

the exciting new
INFO-TECH M-70 CODE/SPEED CONVERTER

HITS & MISSES

George Hammon WA6CQW
14215 Pecan Park Lane SP 73
El Cajon, CA 92021

FROM
THE
MAILBAG

In my column this month I would like to share a letter I have written with you. In the July issue of CQ Magazine, a letter appeared from Victor Clark, Chairman of the long range planning committee and First Vice President of the ARRL. Mr. Clark requested some thoughts, comments and/or recommendations about the future of the Amateur radio service and/or the ARRL. The following is my response:

Mr. Victor C. Clark, W4KFC
Chairman, LRPC
12977 Popes Read Road
Clifton, Virginia 22024

Dear Fellow Amateur:

I wish to avail myself of the opportunity to respond to your letter, as it appeared in CQ Magazine, July, 1979, Page 38. I will address myself in this letter to certain specific areas, which I feel as a concerned League member should be of a priority nature in your long range planning.

Please let me introduce myself first. I have been a licensed amateur for over twenty years, a League member, write the monthly Hits and Misses column in the RTTY Journal and a member of the San Diego Teleprinters Society.

The committee you are Chairman of, is indeed a very prestigious group, and has labored many years in amateur radio affairs. I feel this committee lacks true representation of the League. The committee is composed all male members and lacks a Canadian Division member. The implication is hard to ignore that neither female or Canadian League members will have a voice in the future planning of the League. The powers of your Committee as outlined in your letter are to review and recommend. This leaves me with the feeling that sacred cows, expensive travel and any other item the Board of Directors feel is non-negotiable will be tough to change.

League publications are outdated and simply a rehash from year to year. The need to bring them up to the state of the art should be of paramount concern. The new license manual is a positive step in the right direction. The 1978 League Handbook was apparently a financial flop. The RTTY section is typical, featuring the ST4 RTTY Circa 1970, hardly state of the art. The 1979 League Handbook, I feel, falls into the same trap, and, in the case of RTTY, it was deleted entirely from the book. In all fairness, it does have a nice cover and the

larger size is a joy to my tired old eyes. The 1978 League Handbook was a source of embarrassment to the League at the National convention here in San Diego with Ham Radio selling them for $4.95, and all the League had to show was a 1979 cover with blank pages.

RTTY comprises a large segment of the amateur population. The League attitude to ignore this area of our hobby is indeed perplexing. While '73' and Ham Radio early in the game recognized the tremendous growth potential in this field, and this reaped the financial rewards. The League officials, when asked why RTTY was being ignored in QST at the National Convention in San Diego, could only reply, "we just don't receive any articles."

This status-quo attitude has crept into other areas of the League. Why aren't RTTY Hams listed in the DXCC column? Don't we have the same rights as members of the League? It appears not. Why hasn't the League contacted any of the active RTTY Ham Clubs and solicited their interest and articles for QST? Status-quo, I feel, is the answer.

One of the last bastions of homebrewers is the RTTY Ham. While the League bemoans the moving away from the designing, building and testing of homebrew equipment, '73' and Ham Radio, month after month, provide super homebrew articles for the RTTY Ham.

In conclusion, Mr. Clark, I wish to assure you that I am not anti-League. Quite the contrary, I wish you and your committee every success. I hope in your long range planning, a spot for RTTY will be made. The thought not to dwell in the past is admirable, but without profiting from the past and it's mistakes, the future looks strangely like the past. I hope in some small way, my constructive remarks set forth here will create a spark, the RTTY Ham has looked for since the early days of 1965, when QST was the leader in RTTY.

Yours Very Truly,
George Hammon

The Southwestern Division ARRL Convention will be held on October 19, 20, 21, 1979 at the Anaheim Sheraton Hotel, Anaheim, California and Dee Crumpton, Editor and Publisher of the RTTY Journal, will have a Hospitality Room (1217) for RTTY amateurs. I hope to meet a lot of the RTTY gang in person, so drop by for the pause that refreshes and say "Howdy."

The pre-registration deadline is September 15, 1979 and the cost is $17.00 (complete program), and at the door $19.00. The banquet is only $12.00, exhibits and tech sessions are $5.00 and $6.00 at the door. The pre-registration prize is your choice of the following; Kenwood TS820, Yaesu FT901 or Ten-Tec Omni, so get your registration in early.

DEE, our Editor and Publisher, will be leaving on August 8th for Denmark, and will be staying at 62 Ermelund Svej, 2820 Gentofte, Denmark c/o Hyllested. I hope many of the RTTY gang will drop by and visit her. She will return from Copenhagen on Sept. 2, so please drop by and say "Hi" to our boss.

I am trying to compile a list of RTTY Clubs and will publish them in the RTTY Journal. Please send any information in this regard, and hopefully, we will have a RTTY Directory of Ham Clubs with meeting time, locations, etc.

In last month's column, I explained that any Amateur, who was plagued by the "Russian Woodpecker" could write to the Watch Officer monitoring branch FCC, Washington, D.C. 20554 and report this interference. I would like to update this information with the following — this office is open twenty-four hours a day 365 days a year. The phone number for those who would like to call is: (202) 632-6975. We must make it clear by reporting this continuing interference by the Soviets that it must stop.

In my letter to Victor Clark, you will note I mentioned Ham Radio was selling the League Handbook Circa 1978 for $4.95, and now the price is down to $2.95, a far cry from the original selling price. I believe this affirms my statement that the book was outdated and not state of the art, so it did not sell. What a shame, but the lesson to be learned here is the consumer (Amateur) is not going to shell out his money for a rehash.

The RTTY Journal is still looking for articles on RTTY, construction, FM, microcomputers, Homebrew, and human interest. Please drop me a line, if you have questions on writing format, etc.

HAL's DS3100ASR

By: E.F. Trego — W9WKC
856 E. Washington St.
Hoopeston, Ill. 60942

One could almost see it coming. With the advent of the DS-3000 KSR, it seemed such a little way to go to make it a full ASR. In a previous article in the RTTY Journal, I mentioned that it already had some ASR characteristics. The KSR could at least retransmit a full page or screen of information, giving it a modicum of reperforator capability. A little later it was found that by very slight modification, the 256 character memory could be used for pre-typing while receiving. This was enough for 3.5 lines and at least a running head start on the next transmission. Admittedly blind typing, but so is a keyboard perforator.

The DS3100ASR puts all those limitations in the past. An amazing amount of memory or buffer has been included. 150 lines of 72 characters in the receive buffer and 50 lines in the transmit buffer. The video screen is split so that 12 lines each of transmit and receive buffer are displayed. All lines are numbered. The screen should really be thought of as a window on the buffers, which can be scrolled forward or backward at will. For example: if I pre-type 18 lines into the transmit buffer, only lines 6 to 18 would be displayed, but when the DS3100 is switched to transmit status line #1 is sent first. Each line in the receive buffer retains its line number and as each line is received it moves up a number toward line 150 at which point it disappears from the buffer. The only time line 150 would be seen is to completely scroll the entire receive buffer through the window. When the ASR is first turned on a vertical column of symbols appears to the right of the 72 character lines which show the status of the machine. The top most symbol is "Time" which must be typed in for each use of the ASR. Once set, the clock will keep time within a few seconds a day. Also it can be included with many programmable features. Such as, a "HERE IS" section in which I may have "W8CQ de W9WKCT" and the correct time at the moment the "HERE IS" segment is sent will be included at the end of W9WKC, like 1431GMT.

The next symbol down is code in use such as Baudot, Morse, or ASCII. After that is rate like 45 Baud or 20 wpm. Then the mode as in Baudot of "CONTINUOUS", "LINE" or "WORD". I always use the "WORD" mode which means a typed word in transmit is not sent until the next word is started to be typed. That gives a chance to do a little editing, with the RUB-OUT Key, in case a word is misspelled or the wrong key is hit. USOS appears next (unshift on space). If it isn't wanted, it can be taken out. Now we have "SYNC" or the "diddler" in RTTY language. Again, if it

isn't wanted, it can be taken out. Then; XMIT INHIBIT or XMIT ENABLED. One can go from one to the other at will. Generally, receive in "XMIT INHIBIT" and send in "XMIT ENABLED." As soon as the change is made to "XMIT ENABLE", the contents of the transmit buffer are sent plus any hand typing after the buffer is empty or any programmable features are keyed in. The XMIT ACTIVE status is shown whenever characters are being transmitted, also indicating that the automatic transmit-receive switch (KOS) is in transmit condition.

There are four switching output transistors KY 1 to 4 which are keyboard operated or placed in a program. The ones in use are denoted in the right hand column of status symbols, also may be included in programs.

Number eleven in our downward list of status indicators is HD/FD which means half or full duplex operation. Hams would use the half duplex mode which means the ASR is either in receiving or transmitting condition; with half-duplex, text can be composed while receiving, but transmission must wait until reception is terminated. In full duplex the unit transmits and receives simultaneiously. This can be done either in Baudot or ASCII, but its best use is probably with a computer and there is a modem connector on the back for connection to a computer.

If more receive display than 12 lines is wanted, the receive display can be extended to appear in the transmit portion doubling the amount of receive display. Similarly, any portion of the receive buffer can be transferred to the transmit buffer and edited if desired, then retransmitted a la reperforator. Any sending must come from the transmit buffer.

Before going into the programmable features, I will discuss the physical qualities of the keyboard. It is a full four row ASCII keyboard with most letters and numeral keys made to do triple duty. In adition to a full typewriter board is a "HERE IS" key, a "NEW LINE" key, a CTRL (control) IDENT and a "FN" (function) key. The keys are pyramidal in shape with a flat top. HAL has taken advantage of this particular key design to print on the operator side of the pyramid the additional function of each letter and numeral key. Such operations as Time, Code, Rate, Mode, etc. are quite visible to the operator. There is no "repeat" key since each numeral and letter key will automatically repeat itself if depressed for more than ½ second. The keyboard has a light "feel" and no tendency to key bounce. Contact is made at about half full travel.

In the programmable features the "Time Message" probably comes up as number one and time is shown at the top of the right hand column of status symbols. I have purposely refrained from saying

what keys do what just because without a DS3100ASR it is a useless exercise. Therefore, I say what the ASR does and not how you get it to do it. There is a very complete and detailed 63 page manual which comes with the machine plus a small condensed manual to use at the operating position.

In the case of the time message, the keys used for programming will be given just to illustrate those keys used for programming and similarly all the programs.

The current time plus an additional 16 characters may be programmed and then called for transmission as desired. The entered time is updated and the correct time is always used when it is called. The recommended format is 1223CDT MAY 21, 1979 (all 20 characters). Only the first 7 characters are displayed in the upper right hand corner of the screen (1223CDT). The first four digits must be in 24 hours time. No ambiguity will result if only the first four time digits are used since in the display of 7 digits a cursor is placed between the time and the remaining 2 unprogrammed zeros.

To get all this to happen: depress Shift-FN-TIME keys to start the programming. The bottom status indicator shows PROG to remind the operator to finish the program sequence. Enter the Time message according to the previously suggested format. Then, again depress Shift-FN-TIME. The status indicator turns off and the clock starts counting.

If no Time message is programmed, the upper right status indicator shows the time the machine is turned on and starts counting from 0000.

The Time message is accessed with the keys FN-TIME. The word Time appears on the pyramidal face of the numeral "1" key. When accessed, a bright letter "T" appears in the transmit buffer readout following the last entry. When its turn comes for transmission, the entire time message appears on the screen with the current time. This method saves buffer space as well as assuring the correct time at the moment of transmission.

The "HERE IS" feature I find is one of the most indispensable of the DS3100 and never carry on a QSO without use of several segments. A total of 10 different 32 character HERE IS messages may be programmed and used at any time at the will of the operator.

Perhaps a question comes to mind; "What if I want more than 32 characters?" The 32nd character opens the programming into the next HERE IS and so on. For instance, I use HERE IS to call CQ. My standard format is 9 CQ's and three repetitions of the call, obviously more than 32 characters. I program the #2 HERE IS which of course runs into HERE IS #3. Then, depress the HERE IS key and the numeral 2 key for the requisite number of lines to appear in the transmit buffer display. HERE IS number 1 and 0 may be

permanently programmed. That is, the program will remain even though power is disconnected. I have HERE IS #1 programmed with "de Ed W9WKC Hoopeston Ill." which I usually insert after a string of CQ lines or at the beginning of a QSO not as the result of a CQ. The HERE IS 0, I just include: de W9WKC. The reason being that the "IDENT" key in conjunction with that key transmits the contents of HERE IS-0 in Morse code. When in Baudot or ASCII modes, the RTTY transmit data circuit remains in mark hold condition during the transmission of Morse code.

So that radio amateurs may be reminded of the 10 minute Morse identification requirement, the lower status indicator flashes "IDENT" about 10 minutes after XMIT ACTIVE status is started. The "IDENT" status indicator is reset when transmission is stopped or by operation of the IDENT key and another 10 minute period is started.

The ASR includes an answer-back or WRU feature. It can respond to messages up to 10 characters long. Upon receipt of the proper characters, the WRU feature turns on switch KY4, transmits the contents of HERE IS-1 message, and then turns off KY4. The 9th status indicator shows "WRU ON" or "WRU OFFF." The WRU feature can be used to control auxiliary equipment.

All the programmable features when typed into the transmit buffer are represented in the buffer display by a single bright letter. Such as T for Time, I for IDENT, or a numeral 3 for HERE IS-3 etc. This saves considerable buffer storage but the programs are printed in full when they come up for their transmission sequence.

Baud rates available are 45 baud (60 wpm), 50 baud (66 wpm), 57 baud (74 wpm), 74 baud (100 wpm), and 100 baud (133 wpm). Radio Amateurs in this country are not permitted to use the 100 baud rate in Baudot code.

There are several pre-programmed features: QBF (quick brown fox) and RY. Activation of either QBF or KY keys gives a full line of each or with the repeat ability of the keys any number of lines are available. That is, holding down a key for more than ½ second.

I have refrained from describing the ASCII operation because that code is not yet available to us. Suffice it to say that all the above features can be used in the ASCII mode together with those goodies found in the DS-3000 KSR such as: word wrap-around, automatic non-overprint and automatic insertion of CR-LF-LTRS at the end of each line in Baudot.

There are 9 different data rates in ASCII mode: from 110 baud to 9600 baud. The ASR will receive and transmit, and display the full 128 character ASCII code including upper and lower case.

In Morse operation, transmission speeds from 1 to 175 wpm are available, in one wpm increments. My own experience indicates that the average amateur transmitter is not capable of speeds in excess of 60 to 70 wpm and the percentage of good copy declines very rapidly at speeds in excess of that. Which, I suppose, is the inability of the transmitter to produce a good wave shape at the higher speeds.

All letters, numerals, and punctuation marks in the Continental Morse Code are on the keyboard. In addition are the following frequently used combinations: AR, AS, BT, ES, KN, SK, and a BRK key for keydown testing or tuning of the transmitter. Moreover, almost all programmable features and other attributes of the Baudot and ASCII modes are available in the Morse operation condition.

The receive speed of the DS3100 adjusts automatically to track the speed of the incoming signal over a range of 1 to 175 wpm. Any setting of the transmit speed has no effect on the received speed.

Unlike the other two modes, Baudot and ASCII, Morse does require a certain operator proficiency for receiving. Like most things, however, the more we do it, the better we get at it.

When receiving Morse code, the receiver is adjusted so that an 800Hz tone plus or minus 100Hz is produced when the transmitter key is down. This should cause the CW DETECT lamp to flash in unison with the incoming CW signal. The receiver should be tuned to a no signal frequency and just background noise is heard. Starting from the extreme counter clockwise position the THRESHOLD ADJUST control, on the front panel next to the CW DETECT lamp, should be adjusted so the CW DETECT lamp no longer flickers wit the noise. The operator's problem is to get a good solid signal to show up on the CW DETECT lamp with as little noise as possible.

The receive decoding circuitry can be reset at any time in case it becomes "lost" or fails to track the incoming signal.

The terminal unit will decode well-sent Morse under even adverse conditions, but is surprisingly tolerant of moderate inaccuracies in the dot-to-dash weighting of hand sent Morse code.

Commercial Morse transmissions and W1AW bulletins are good sources of well-sent Morse and can be used for practice in reception.

In the beginning of this article I mentioned that I thought I could see the development of the DS3100ASR and its appearance on the scene. But, I don't know where we go from here. Except for some minor future improvements and modifications, it looks as though the present state of the art is about used up for now.

UART CONT. FROM LAST MONTH.

Other less important but interesting features are noticed as well. For instance if somebody diddles the break key to set their shift, normally your printer would run open whenever they go to space, or until the anti-space locks up at which time you invariably print an error due to the anti-space bringing the printer back to a mark pulse. With the Uart, it will trip off one blank, and wait for the next transistion. As a result you print one blank character each time they diddle the space key, assuming they hold it down more than 1/6th second, the time for one normal character. The interesting thing occurs when requiring a valid stop pulse by connecting pins 14 and 21 instead of grounding 21. With the TI or GI UARTS, the unit sees no stop pulse, says that is no character, dumps the receiver shift register and as a result no characters are printed at all! Thus with somebody going from mark to space slowly, you would think you were locked into standby as you in effect are!

This feature is of some interest to people having the autostart turned off. Random garble will print maybe 30-40 per cent the number of characters normally printed.

Another perhaps minor advantage of the regenerative repeater comes from receiving signals off the frequency. Since distortion increases as the signal gets further to one side of the filters in the demodulator, the UART (or any other regenerative repeater) tends to continue printing properly longer than the typical printer could by itself.

Of course it goes without saying that such a device is quite beneficial to anybody retransmitting to another frequency, such as 2M repeaters, etc. At least all stations on the frequency ought to print the same identical copy.

The regenerative repeater also would be quite useful as an output device between a poor keyboard and the signal sent out over the air. Such a device can turn the poorest model 15 into a signal equal to the very best, or can take a model 14 TD with dirty contacts and have perfect output copy, assuming the contacts were not bad enough that nobody could print anything even with the repeater!

At least the service offers a tremendous improvement in ability to transmit and receive with marginal equipment, and should improve the copy to a noticeable extent on any teleprinter in marginal copy.

One of the authors W6FFC has been using a computer with video display since 1972. As it has electronic regeneration, it was at times quite evident this was an advantage as the video display would regularly have fewer errors than the 28ASR on the same loop output! Many times an entire word would be lost on the 28 that could easily be deciphered with maybe one error on the screen. It was this "revelation" in fact that led to immediate interest in the UART when W6LLO first started experimenting with the device.

CONT. NEXT MONTH

Greetings to all....

Signs of summer vacations are very evident here with the lack of activity and small mail bag. The Italian group have split up the Flash contest this year which has its good and bad points. The one bad on that might come out of it is that WAC may be more difficult then ever before.

To overseas amateurs only, when you have completed the DXCC requirements, photo copies of your cards and a signed statement verified by two officers of your Amateur group is all that is required for proof of contacts. The reason for this change is due to the loss of some QSL cards which can never be replaced.

I am very pleased to see that Rob G8LT is back at the Helm again after a long illness. Rob writes the HF column of the BARTG newsletter.

While on the subject of BARTG the summer schedule for their news service is as follows:

3.590 MHZ	1100, 1130 and 1800 hours
144.600 MHZ	1100, 1130 and 1230 *
14.090 MHZ 0730 hours beaming South-west	
	1530 hours beaming last
	1900 hours beaming North-west.

All times are GMT, all frequencies are plus or minus 2KHZ. The VHF transmissions are made twice, first using FSK and then using AFSK. All transmissions are 170HZ shift. 45 bands.

*Northern Ireland only.

F0FBM/FC is now active from Corsica he is on daily fdrom 1300 to 1800 and 2000 til 2200Z.

K0BJ left Bali 14 July heading for Singapore and apparently was not able to obtain a license. Bruce hopefully will be active from 4S7 early August and 8Q6 in mid August.

JA0BXU/SU is now working stations other than Japanese. He has worked several Italians on 20 meters at 2000Z. He is inverted and does not answer CQ. he will send 1 short CQ and if no takes he goes QRT.

Most people by now have the story on the ZB2EY Trip to Gibralter. Walter reports that they had all the RTTY gear there but had forgotten the TU. Talk about having a (Red Face) Hi Hi.

There will be another C31 station on about the first week of August signing C31SE.

Al WA6QFN is suppose to be in 7P8 land for the SARTG contest.

QSl info
VR1AF via W7OK
JA0BXU/SU P.O. Box 150 c/o PENTA OCEAN CONSTRUCTION COMPANY, LTD, ISMAELIA, EGYPT. QRA YOSHIAKI TASHIRO
VR3AH via WB4PRU
VQ9MR via N5Gu
5N0DoG via W4FRU
UT5RP direct to Box 373, Vdessa.
5B4HF direct to John P Hurley Box 4180 Nicosia Cyprus
DXCC #38 dated 16 July 1979
to ●●●◑

THOMAS SCHIEB DK2KU
In der Mulde 7
5064 Roesrath - Forsback
West Germany.

K7BV Mac has reached a count of 150 confirmed

KB9DM worked W.A.C. during this years BARTG. This certificate will be issued with out a number as it was on several bans.

Also this log took 3 months to arrive by surface mail way past the due date for the arrival of logs. All stations should keep this in mind and ALWAYS use air mail for contest entries.

ISAA Ros Pentimalli has confirmed 144 countries and will be issued endorsement #140 to go on his Plaque DXCC #25

Those people submitting for DXCC awards are initially sent a paper certificate listing their DXCC member and date. This is done due to the long time typically 3 to 4 months that it takes to get the plaques made up and shipped. So please hang in there with us and your awards will arrive sooner or later.

Don't forget Oct is CARTG and that the SARTG is this month. I wish to thank Happy W3DJZ and Mac K7BV for their inputs for this month.

73 de Skip

COMPUTER TALK CONT

BASIC (Or more correctly BASIC IN-TERPRETER) is a program that allows you as a programmer to 'talk' to the computer in a simple form of english rather than machine language. Machine language is what the computer uses internally and is a very cumbersome method of communicating with the computer. BASIC allows the programmer to use simple english words and have the computer understand them. The BASIC IN-TERPRETER does the same thing that human interpreter does at the United Nations.

DALE OTT-AH6AC "SCATTER"
So. Counties Amateur TELE-printers Society (Ca.)

FIVE-SEVEN OH

Back at the end of 1977 I proposed the creation of a new RTTY simplex frequency on Two Meters to replace 146.700 MHz in the Boulder-Denver Metro area. The frequency first announced was a poor choice. However Les Bruce — W0OX picked up on the idea and has made it work. He and the other Two Meter RT-TY'ers have been using 147.570 MHz for quite a while with no interference or other problems from other groups.

CHEYENNE MTN RTTY RPT

The Cheyenne Mtn ARC sponsers WR0APP (147.945/147.345 MHz) in the Colorado Springs as an open RTTY repeater. Coverage is from south of Pueblo to north of Monument. Standard RTTY tones of 2125/2295 Hz are required to bring up the system. For more information on WR0APP contact Gus - WB0OPR.

"Kontest Korner"

Classified Ads

THE DOVETRON SSD-100 solid state cross display replaces the conventional CRT and accociated high voltage power supplies as the tuning indicator in the MPC-Series RTTY terminal units.

In addition to "instant-on" operation and a predicted reliability in excess of 100,000 hours, the solid state display out-performs the original CRT in every instance.

The absence (or deactiviation) of the high voltage supplies and the resultant decrease in heat generation increases the MTBF (Mean Time Before Failure) of the terminal unit more than 10 times.

The display itself consists of high intensity (4 millicandelas), red, rectangular LEDs (Light Emitting Diodes) arranged in the traditional cross pattern and operated in a baragraph mode. The two LEDs that form the apex of the cross are tied into the terminal unit's logic in such a way that they extinguish if the TU is improperly tuned to the incoming tones, or if the incoming signal is up-side down in respect to the "sense" of the terminal unit.

A separate LED in the upper left quadrant of the cross display monitors the two input channels and flashes" in the presence of time or frequency dispersive multipath distortion, indicating that the MULTIPATH CORRECTOR should be turned on.

Separate LEDs in two other quadrants monitor the status of the internal loop, the Signal Loss circuit and the Send/Receive mode of the terminal unit, making the SSD-100 a convenient display center of the various functions. A light sensitive photocell in the fourth quadrant monitors the ambient light conditions at the operating location and automatically adjusts the display's light output. Under normal conditions, the SSD-100 may be read comfortably from 75 feet.

The new front bezel contains an antiglare optical filter and provides 30% more viewing area than the original CRT bezel.

A retrofit kit (SSD-100K) is available to update existing CRT-equipped terminal units in the field. Your inquiry will bring complete details by return mail. DOVETRON, 627 Fremont Avenue, (PO Box 267), South Pasadena, California 91030.

TELETYPE 43 KSR RS-232 $999.95 Factory New. Postpaid USA. Data Mart, 914 Waverly, Arlington Heights, IL 60004, 312-398-8525. 6-11 PM CST.

THE RACK LINE BY DAYTAPRO, for individual or repeater these versatile uniform boards will do the job rite. All boards are 4½" X 6½" (same as the DT-600) G-10 1 oz copper solder plated with a 22 Pin edge connection. All kits have edge connector included.

CW ID SYSTEM, interfaced for digital, FSK or AFSK keying, 10 minute timer, variable speed (5-24 wpm) 12 or 5 volt use. Kit 27.90, Board alone $8.95.

MINI VERSION OF above CW ID (CW ID only) Kit $19.95. (NEW LOW PRICES)

M4D POWER SUPPLY, Plus 5 volts and 1 amp with crow bar protection, Plus 12 volts and 1 amp and minus 12 volts at 1 amp. Each fused and has LED indication. Kit $32.50 BOARD alone $8.50.

DUEL XB-6 CRYSTAL CONTROLLED CLOCK for UAR/T control develops 6 baud rates each. Kit $26.95 board alone $8.50.

CRYSTAL CONTROLLED AFSK. Now enjoy rock solid frequency with no drift. Kit $28.49 BOARD ALONE $8.75.

TU-LOOP POWER SUPPLY. Low voltage supplies (+5, +12 and -12) all rated at 800 mils each with a high voltage loop supply with the keying transistor located on board. Also has a 20 mil loop driver and keying provisions, input keying need be only 5 volts and ground. Kit $52.49 Board Alone $8.50.

EXTENSION BOARDS (available in July, 1979.) Two types. Stright for rack testing and 90 degree angle for cabinet testing. With Edge connector Kit $13.95.

UT2B SPEED CONVERTOR (Available in October 1979) Write for additional information.

UNIVERSAL BOARD (Available in September 1979) Write for additional information. DAYTAPRO ELECTRONICS, INC., 3029 WILSHIRE LN, ARLINGTON HTS, IL 60004. PHONE 312-870-0555 EVENINGS. Add $1.00 for shipping, Visa accepted.

TELETYPEWRITER parts wanted for all machines manufactured by Kleinschmidt, Mite and Teletype Corp., New only, Also sub-Assembled. I pay shipping. Phil Rickson, W4LNW, Rt. 6, Box 1103G2, Brooksville, FL 33512.

SALE! SALE! SALE!SALE! SALE! RTTY ID GENERATOR. Accepts 5 or 12 volt supplies, 31 characters available, (please include letters, figures, spaces etc.) Your pre-programmed answer-back must be supplied with order. EXAMPLE: DE K9WRL NEIL ARL HTS ILL. Board is the same size as the ST-6 Boards. WAS $34.99 SALE PRICE $24.95. BOARD ALONE WAS $8.50 SALE PRICE $6.95. ADD $1.00 FOR SHIPPING. DAYTAPRO ELECTRONICS, 3029 N. Wilshire Ln. Arlington Hts., IL 60004 VISA AVAILABLE. PHONE ORDERS 312-870-0555 EVENINGS.

UT-4B KITS NOW AVAILABLE, All logic, resistors, capacitors, diodes and transistors to fill board, edge connector included. See November 1978 RTTY Journal for users report. Kit 109.95, UT4B Board alone $17.95 M4D POWER SUPPLY for UT-4B, Kit $32.50, Board alone $8.50 DUEL XB-6 OPTIONAL CRYSTAL CLOCK for UT-4B, Kit $26.95 Board alone $8.75. Additional information available with a stamp. DAYTAPRO ELECTRONICS, INC. 3029 N. WILSHIRE LN, ARLINGTON HTS., IL 60004 VISA ACCEPTED, PHONE EVENINGS 312-870-0555.

FOR SALE: RTTY Demodulator, designed especially for the reception of shortwave RTTY signals with various types of speeds and shifts. The PLL circuit is adapted automatically to the shift of the station received! Printing usual stations like press, military, amateur, diplo, weather, etc., is rather easy with this LED-controlled unit. Features: switchable audio filter; autostart relay; power supply 220 V AC 50 Hz; outputs: loop supply for mechanical RTTY machine, and/or TTL-compatible for VDU. Price, including packing and surface mail postage to anywhere in the world, DM 460.00 or $260.00. Some more information is air mailed to you for DM 10.00 or $6.00; this amount is credited on the final price of the unit if ordered later on. Joerg Klingenfuss, Goethestrasse 14, D-7400 Tuebingen 1, West Germany.

TELETYPE MANUALS — Model 28ASR, 3-volume set $24.50 plus $1.00 postage. Manuals also available for Model 15, 19, 32, 33, 35, plus thousands of others on military surplus receivers, transmitters, test sets. Send 50c (coin) for large list. S. Consalvo, W3IHD, 7218 Roanne Drive, Washington DC 20021.

END OF LINE ALARM FOR 28 SERIES TELETYPE

Having owned various model 28 teletype machines in recent years and not liking the end of line light, (versus an audible sound), I set out to do something about it. The general idea was to keep it simple. The schematic shows the end result.

A 741 op amp was used as a simple audio oscillator. Component valves are not critical. Varying R-2 will change the oscillator pitch. Varying the value of R-3 will vary the audio output level.

As you can see from the schematic the power source is the voltage which is normally applied to the end of line light.

I broke the glass out of an old light bulb and soldered into the base which was then plugged into the socked on my 28 ASR. No modification of the machine is necessary. The printed circuit board is only about 1½" square. It and a separate 2" speaker were both mounted near the end of light bracket up under the lid.

Little brackets were secured to both the speaker and the circuit board so as to hold them in place under existing bolts.

The end result is great. The little end alarm works great and frees one from having to watch for the end of line light.

Gordon Weiler, W9ZQK
4843 N. 90th
Milwaukee, WI 53225
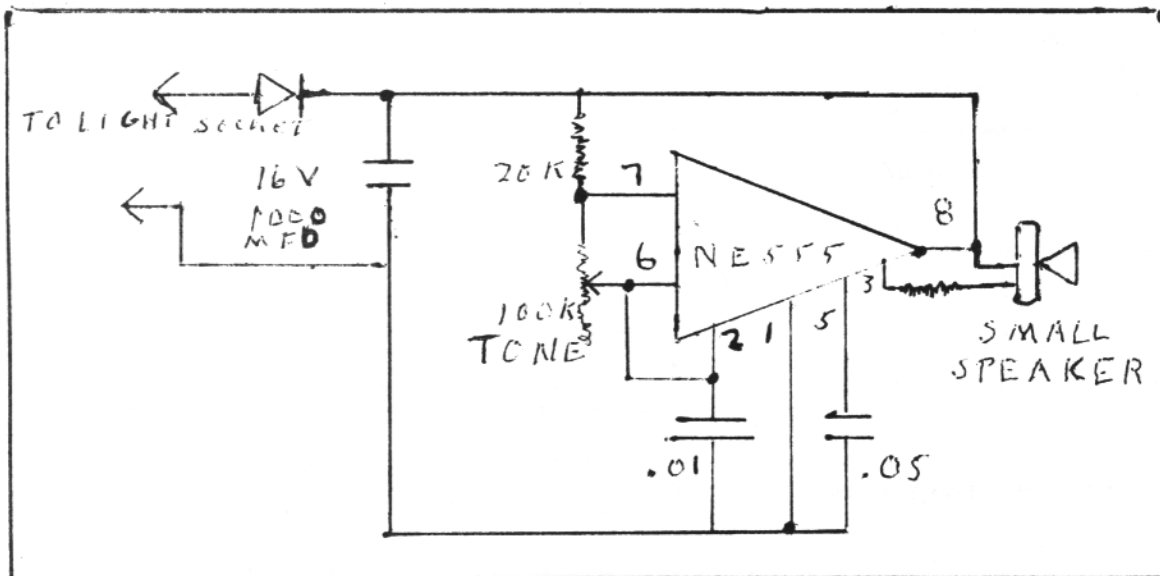
HITS AND MISSES   con't

Arny Gamson, K6PXA, who writes the VHF RTTY News for the RTTY Journal, is still waging a battle with Cushman's disease. I know Arny would love to hear from you. His address is 8034 Gentry, N. Hollywood, CA 91605.

When I was in Las Vegas in January of this year at the Consumer Electronic's Show, I ran into Leonard Norman, who runs the SAROC Ham Convention. I discussed the hope of SAROC being held in 1980 and was left with the impression that it may. The ads in radio magazines show indeed it will. The location is Las Vegas, Nevada, DUNES HOTEL, and the date is January 10th thru the 13th. I hope several of the RTTY Clubs will formulate a forum, but more on this next month.

So long for now. . .
George WA6CQW

All VE/VO on RTTY,

Rules:
1. Contacts must be two-way RTTY only, any date.
2. Awards will be Certificates, numbering from ONE.
3. There is no charge for the award, but the necessary QSL cards are to accompany the request. These will be returned.
4. An official of a RTTY Group or Society may inspect an send in a signed statement with list of such QSL cards, including all pertinent information (in place of sending the actual QSL's).

Send all requests to: —
The Canadian Amateur
Radio Teletype
Group — VE3RTT

Send all request to: —
The Canadian Amateur Radio Teletype Group — VE3RTT
85 Fifeshire Road   Willowdale, Ontario
CANADA   M2. 2G9.

The "C.A.R.T.G." Merit Award.
The orignal "C.A.R.T.G." Merit Award was created in 1967 to be presented annually to the Radio Amateur chosen for his outstanding contribution to the art of amateur radio teletype communications. It need not necessarily be confined to technical contributions but recognition of any outstanding achievement world-wide,

RTTY Experimental Work, Rtty Technical articles
Traffic Handling or organized net operation,
RTTY DX for world-wide good will.

Assistance to the blind or handicapped in RTTY.
Or for any other outstanding RTTY achievement.

A plaque has been offered for this award, complete with engraving, and the "C.A.R.T.G." is pleased to request the names of suggested quallifiers be sent in for consideration.

Recommendations should be sent to: —
85 Fifeshire R.
Willowdale, Ontario.
CANADA.   M2L 2G9.

I recommend ?

Qualification ?

THE CANADIAN AMATEUR RADIO TELETYPE GROUP [VE3RTT]
19th Annual
W/W RTTY DX
[Canada 79' Sweepstakes
October 20-22nd, 1979. 0200GMT

AWARDS
First   Plaque — "C.A.R.T.G."
Second   Plaque — "RTTY JOURNAL"
Third   Plaque — "C.A.R.T.G."
Fourth   Plaque — "RTTY JOURNAL"
Fifth   Plaque — Member of CARTG
Sixth   Plaque — "C.A.R.T.G."
Seventh Plaque — "RTTY JOURNAL"
Eighth   Plaque — "C.A.R.T.G."
Ninth   Plaque — "RTTY JOURNAL"
Tenth   Plaque — "C.A.R.T.G."
11. Canadian High Score Gold Medallion & Ribbon
Director CRRL Award
12. Most contacts on 80 M.
Plaque — "RTTY JOURNAL"
13. Green RTTYer (First RTTY Contest.)
Sidney Burnett Memorial Plaque
14. Most two-way RTTY contacts made with Canadian Stations.
Plaque — VE2JR.
15. High Score for low Power Canadian Stations.
Plaque — West Coast Canada Award Sponsored by VE7AKW
16. Most two-way 40 M contacts.
Plaque — CARTG Member
17. Multi-operator station with one transmitter
Plaque "C.A.R.T.G."
18. SWL Printer   Plaque — "C.A.R.T.G:"
19. Most two-way 10 M contacts.
Plaque — "C.A.R.T.G."
20. Certificates to be issued to top scores in each U.S.A., VE/VO and VK District, and each country.

THE CANADIAN AMATEUR RADIO TELETYPE GROUP [VE3RTT] Sponsors

The 19th Annyal
W/W RTTY DX
'Canada 79' Sweepstakes

Rule Sheet.

1. **Test Period:** Saturday October 20th, 0200 GMT to Monday October 22nd, 1979. 0200 GMT. Not more than 30 hours of operating is permitted. Non-operating periods can be taken at any time during the Contest. Summary of times on and off must be submitted with score.
2. **Bands:** Use all bands 3.5, 7, 14, 21 and 28
3. **Classifications:**
   (a) Single Operator
   (b) Multi-operator
   (c) SWL
4. **Messages:** To consist of RST, Time GMT and Zone.
5. **Exchange Points:** All two-way RTTY QSO's with ones own. Zone counts 2 points. All other contacts will receive points listed on Zone Chart.
6. **Multipliers:** Country status as ARRL Country List, KL7, KH6, W/K, VE/VO and VK Districts counted as separate countries. Stations not to be counted more than once on any one band. Additional contacts counted on different bands. One's own country counts as a multiplier.
7. **Scoring:** Total Exchange Points X Number of countries worked X number of Continents (Max 6). Two hundred (200) Bonus Points for each VE/VO contact made on all bands added finally to total score.
8. **Logs:** Logs to contain Band, date, time GMT, RST, call signs, exchanges sent and received. Use separate Log Sheet for each band. Send SASE or IRC's to CARTG for Log Sheets and Zon Charts. Logs must be received before January 1, 1980 to qualify. Send Logs, time summary and scores to
Canadian Amateur Radio
85 Fifeshire Road, Willowdale,
Ontario. CANADA
M2L 2G9.

VE3Rtt   VE3AYL

Til next month

Skoal !

DOVETRON

MPC-1000C

Multipath Correction
In-Band Diversity &
AFSK Tone Keyer

Amateur Net: $545.00

Standard features include CONTINUOUSLY tuneable Mark and Space channels (1000 Hz to 3200 Hz), Dual Mode (MARK or FSK) Autostart and internal high level neutral loop keyer (20 to 60 ml). Both EIA and MIL FSK outputs are provided for direct interface to microprocessor and video terminal peripherals.
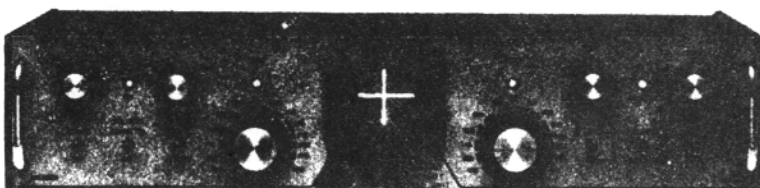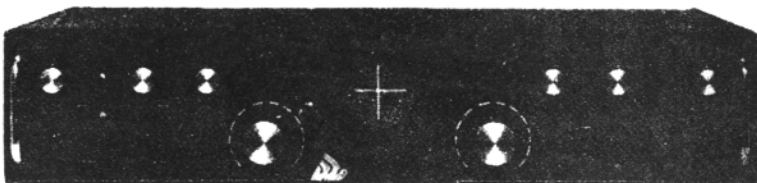

MPC-1000CR

Signal Regeneration &
Speed Conversion

Amateur Net: $645.00

A front panel switch permits internal TSR-200 Signal Regenerator-Speed converter assembly to electronically "gear-shift" between 60, 67, 75 and 100 WPM. All incoming and outgoing signals are regenerated to less than 0.5% bias distortion. Also available with DIGITAL Autostart (TSR-200D): Amateur Net: $695.00

MPC-1000R/- TSR-500

Dual UART Regeneration,
Speed Conversion, 200
Char. Memory, Word Cor-
rection & DIGITAL
Autostart

Amateur Net: $895.00*

The MPC-1000R/TSR-500 provides Preloading and Recirculation of the 200 character FIFO Memory, a keyboard-controlled Word Correction circuit, Variable Character Rate, Tee Dee Inhibit, Blank/LTRS Diddle, a Triple Tone-Pair AFSK Tone Keyer and a Character Recognition/Speed Determination DIGITAL (DAS-100) Autostart mode.

*The MPC-1000R is also available without a TSR assembly and functions as a MPC-1000C with a Triple Tone-Pair AFSK Tone Keyer. This "Basic-R" permits future expansion with a TSR-100, TSR-200, TSR-200D or TSR-500 by simply lifting the lid and plugging in the appropriate TSR assembly: Amateur Net (Basic-R): $595.00
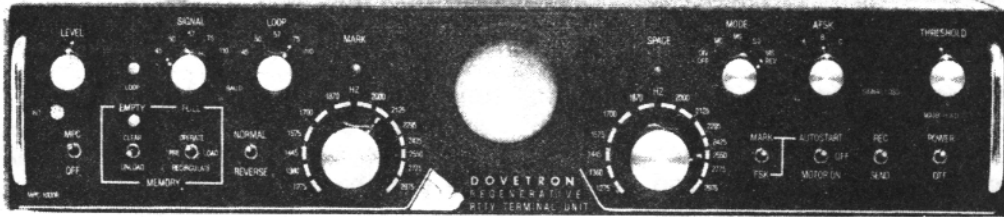
Your QSL will bring complete specifications, or call: 213-682-3705.

DOVETRON

627 FREMONT AVENUE
(P. O. BOX 267)
SOUTH PASADENA, CA. 91030