

MESSAGE CONTROL UNIT

Introduction:

The Message Control Unit (MCU) is a device which permits the use of a Model 14-type Transmitter Distributor for transmission of short-message announcements or lengthy bulletins, depending on the application. For instance, an Automatic-Control equipped Phonetype installation may have a short announcement giving the name of the station and a request for the calling party to leave a message. The TD has a loop tape with the message punched in, and the MCU will now automatically control the installation, in cooperation with the ACU-Phonetype set. The teletypewriter motor will be running at the same time the tape announcement is being sent; this enables definite separation of different messages from different callers over a period of time. The CARRETS and LINEFEEDS, punched into the looped tape, will see to the separation between the different messages.

The MCU setup for lengthy messages, as in bulletin service, is the same as the above, except that the teletypewriter motor will not be running during the bulletin transmission. At the end of the bulletin, however, the tape will stop and the TTY motor will turn on, readying the TTY for reception of messages as may be "left on the printer" by the calling party.

The differentiation between short message announcements (TTY motor on all the time) and bulletin service (TTY motor off during bulletin transmission) is controlled by a toggle switch on the top of the MCU. Further, the safety shutdown timer (inside the MCU) must be adjusted as will be explained later on.

A pushbutton, marked TEST, is used for restarting a stopped tape, as needed. Also, it is used for testing the calibration to be sure the MCU responds properly to keyed-in BLANK-key characters.

Modus Operandi:

Incorporated into the MCU is a BLANK-signal detector. When it senses a BLANK signal, coming from the tape, it trips a relay, and this relay then stops the TD by de-energizing the TD's latch magnet. A single BLANK character is sufficient; it consists of a row of no-punchings for the five spacebits for the Blank signal.

The tape is best prepared in this manner: At the beginning of the tape, punch in several LTRS, then CR, two or three LINEFEEDS, then the bulletin or message text. At the end of the text, punch in LTRS, CARRET, two or three LINEFEEDS, --- and, then, --- one BLANK, then several LTRS. Trim the ends of this just-prepared tape, line up and join the ends. Before joining the ends, apply some Duco cement to both ends, along a line of LTRS on each end (that is, along a row of five holes as punched for the LTRS signal involved). Then press together the overlapped LTRS punchings and keep wiping off the Duco cement with your fingers until things dry out -- meanwhile keeping the ends aligned. In about 15 seconds the Duco-cemented joint will be dry, and the LTRS holes will be clear, and the completed looped tape is now ready for use. This loop tape should last for quite a long time; I have had such looped tapes running for months in my radio teletypewriter equipment.

Connections:

The MCU has a cable coming out of one end, ending in seven (7) colored wires, fitted with spade lugs.

POWER CONNECTIONS

A = BLACK WIRE = 115VAC (HOT)
B = RED WIRE = 115VAC (NEUTRAL)
C = GREEN WIRE = GROUND (CONNECT TO TD BASE FRAME)

T.D. START (OR LATCH) MAGNET CONNECTIONS

D = WHITE WIRE = T.D. START MAGNET (THESE WIRES GO TO RELAY CONTACTS IN THE MCU)
E = ORANGE WIRE = T.D. START MAGNET

SIGNAL CONNECTIONS

F = BLUE WIRE = POSITIVE SIDE OF KEYBOARD LINE (IN SERIES)
G = BROWN WIRE = NEGATIVE SIDE OF KEYBOARD LINE

The Model 14 T.D., as typically mounted on the left side of a Model 19 composite set, has connections already in place for normal operation with the Model 19. The TD keys into the keyboard line; this keyboard line also includes the keyboard contacts in the teletypewriter portion. In short, the TD and the keyboard contacts are both in series and are plugged into the KEYBOARD JACK of the Phonetype Terminal Unit.

The MCU signal connections are to be placed in series with this keyboard line; that is, all three devices - namely, the TD contacts, the keyboard contacts, and the MCU signal inputs - are to be all in series and connected to a Keyboard plug, which then plugs into the Phonetype TU. The signal line in the MCU box is just an input to a sensor circuit, arranged so it will detect a BLANK signal coming through the keyboard line. This Blank signal can be from the tape or from the keyboard; the latter being for test purpose.

It is necessary to observe the polarity of the keyboard connections, when it is broken for including the MCU in its loop. The BLUE wire is to be positive with respect to the BROWN wire; otherwise, the sensor circuit will not operate.

Fig. 1 shows the basic wiring arrangement for the Message Control Unit-Transmitter Distributor combination. It is the simplest possible, and it can be fitted into various setups, such as the Model 19 composite set, or for use with a Model 15 or a Model 26, making use of a separately-mounted Model 14 T.D. The orange-and-white "T.D. Magnet Connections" wires go to a pair of contacts in the MCU relay. Any kind of power could be controlled through these wires, 120VDC, 115VAC, 9 volts DC, anything. The latter 9 volts is for application to power control on a Craig 212 type tape player, fitted with a continuous-loop message announcement tape. Thus, the MCU has been designed to be as versatile as possible.

The MCU's keyboard line (blue and brown wires) connects to an isolated Blank detector circuit. The line could be grounded on one side or floating above ground, depending on keyboard arrangement.

Mounting the MCU on a Model 19 Composite Set:

Some reference has been made to the Model 19 set in the preceding section. Now, please refer to Figure 2; it details the wiring connections as would be made to a Model 14-type TD jackbase, already mounted on the Model 19 table.

The MCU signal connections, as mentioned, are to be placed in series with the keyboard line. This is accomplished by moving the TD signal wire from its jackpoint #3 to the nearby (supposedly vacant) jackpoint #4; the latter then serves as a tie point. The MCU signal connections go to these jackpoints, #3 and #4. However, take note of the polarity of these two points, by using an appropriate meter. (A Milliammeter, 0-100 mA, will be fine; take note of the meter polarities, so you know which is which. Mark each jackpoint with the correct polarity, + and -. Turn on the Phonetype station so as to determine the polarities; before turning on the power, place the milliammeter clips on the indicated #3 and #4 jackpoints. (BE CAREFUL NOT TO TOUCH THE AC POWER JACKPOINTS, which are #5 and #6.)

The BLUE wire will now go to the positive (+) jackpoint, and the BROWN wire will go to the negative (-) jackpoint.

The orange and white wires are next considered; they terminate in a pair of contacts on the MCU relay. Thus, when this relay acts to close these contacts, the orange and white wires are connected together, and, hence, current will flow, thus energizing the START MAGNET on the TD. The power required by this start magnet may be either AC or DC, depending on the individual installation; this does not matter as far as the orange and white connections are concerned. Tiepoints #8 and #9 are involved. (Jackpoints) Our problem is to place the relay contacts (in the MCU) in series with the TD start magnet coil and its seriesed current-limiting resistor, both being inside the TD unit, and in series with incoming TD start-magnet line.

As we have run out of tiepoints; i.e. there are no more vacant tiepoints available, we will move the start-magnet wire from its upper screw on jackpoint #9 to the lower screw on the same jackpoint #9. The lower screw then serves as a tie point, and the TD will operate properly when it is plugged in, and wired as indicated for the MCU.

CONNECT THE ORANGE WIRE TO THE LOWER SCREW ON THE #9 JACKPOINT.

CONNECT THE WHITE WIRE TO THE UPPER SCREW ON THE #9 JACKPOINT.

Do not disturb the #8 jackpoint and its start-magnet line wire.

The power wires for the MCU are colored BLACK, RED, and GREEN. The BLACK wire goes to jackpoint #5 and the RED wire goes to jackpoint #6; both of these jackpoints already have AC power wires connected thereupon and will now supply power to both the MCU and the TD.

GROUND THE GREEN WIRE TO THE METAL FRAME OF THE T.D. base.

RECAPITULATING:

The signal input of the MCU is placed in series with the keyboard line (BLUE and BROWN wires; check polarity if necessary).

The start magnet connections are placed in series with the start magnet line feeding into the TD base. (Orange and White wires).

The power connections are placed on the existing power connections of the TD (Black and Red wires.) The ground (Green wire) is connected to the metal frame of the T.D. base.

Rewiring the power connections on the teletypewriter portion of the 19:
(This is only necessary for Bulletin Service application)

Procure a 3-wire power cord and plug. Fit spade lugs on the black, white and green wires thus stripped. It is to be used on the teletypewriter portion of the Model 19; it is desired that the motor of said TTY be controlled by the MCU relay through this power cord. This is the reason for the AC outlet on top of the MCU box.

On the Model 15/19 installations, the TTY has a large 4-prong plug with four wires, red, green, black, and white. The green wire goes to TTY base ground, the black wire goes to 21, the red wire goes to 22, and the white goes to 23. These wires are to be disconnected from the TTY's terminal strip, and the new three-wire power cord placed thereupon.

Black wire goes to 21 or 22 (22 preferred; this bypasses the TTY motor switch)

White wire goes to 23

Green wire goes to TTY base (ground)

Place the plug into the receptacle on the MCU, and the system should be ready for tests and operation.

Tests and operation:

Turn on the ACU-MCU-Phonotype installation. The MCU should now begin transmitting, if there is a tape already on the T.D. The MCU should and must stop transmitting when it senses a BLANK character on the tape. (Should the MCU fail to keep running the tape when power is turned on, the signal wires may be reversed. These are the Blue and Brown wires.)

The switch on the MCU, in TTY OFF position, arranges the MCU so that when it is transmitting a tape, the TTY motor is turned off. In TTY ON position, the TTY motor runs during tape transmission. This switch can be used for monitoring the bulletin coming off the tape, if desired. Otherwise, it is in TTY OFF so that the TTY need not receive bulletins over and over as people call in for it.

When the MCU stops transmitting on the tape (controlled by a BLANK character in the tape), it turns on the TTY so that the calling party can "leave a message". This should be quite obvious.

The TEST button can be pressed to restart the stopped tape; at least, in bulletin service, with safety timer disconnected, more on this later.

Another Modification to the Model 19 set:

By the way, it is well to disable, in some manner, the SEND-RECEIVE switch on the left side of the 19 Keyboard. That is, the T.D. should operate and send a tape, no matter which position this SEND RECEIVE switch may happen to be in. The easiest way is to jumper the leaf contacts immediately behind the curved shield panel.

Needless to say, when the bulletin service is on, the keyboard lever switch on the right side of the keyboard is left in TAPE position. This also applies to the message announcement service.

The MCU Safety Timer system:

The safety timer, incorporated in the MCU design, stops the tape after about 20 seconds. This is in reference to the message announcement application; i.e. an announcement tape such as

"APCOM MENLOPARK. PLEASE LEAVE A MESSAGE. THANK YOU. GA"

will ordinarily last not over 12 seconds (72 characters to a line, 6 prints per second = 12 seconds). Should the tape loop ever get jammed in the TD, it could conceivably generate a certain letter over and over, and the ACU system will be unable to shut down. The teletypewriter machine would then run for a long time. Hence the purpose of the safety timer is to shut down the MCU should it happen to be 'jammed on', being unable to turn itself off due to lack of a BLANK signal in the jammed tape.

However, with respect to bulletin service, using a tape which could run as much as 10 or 20 minutes -- the MCU safety timer must be disabled. Certainly, the tape could jam, but less harm is done here, as the teletypewriter machine will not be running during bulletin transmissal. Some external safety timer circuit could be used; this is a matter for another-time discussion.

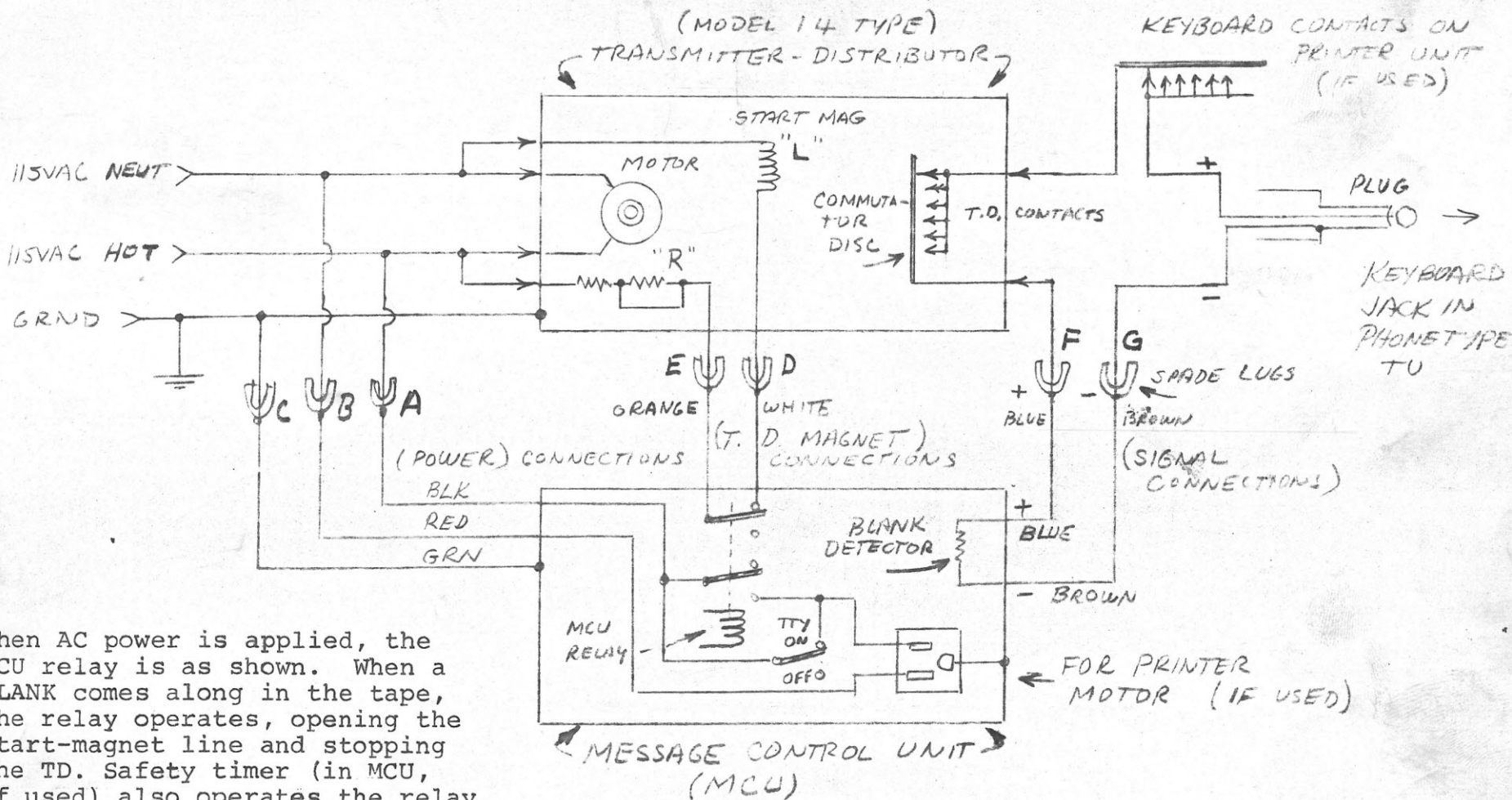
THE MCU UNITS COME WITH THE SAFETY TIMER CIRCUIT SHORTED OUT BY MEANS OF A PIECE OF YELLOW WIRE CONNECTING CERTAIN POINTS ON THE MCU'S PRINTED CIRCUIT. TO ACTIVATE THE SAFETY TIMER, AS FOR MESSAGE ANNOUNCEMENT SERVICE ONLY, JUST CUT THE YELLOW WIRE AND SEPARATE THE CUT ENDS - OR ELSE UNSOLDER THE YELLOW WIRE AND REMOVE IT. (IT WILL BE NECESSARY TO OPEN THE MCU CASE TO GET AT THIS WIRE). (This wire is on the printed circuit side.)

Remarks:

This is a rather detailed set of instructions for the MCU. It is a special accessory, designed to control a loop tape as for message announcement service-or bulletin service. It is designed specifically for the Model 14 type TD as used separately or in conjunction with a Model 19 set. It could conceivably be used for controlling a magnetic tape player, equipped with a loop tape.

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When AC power is applied, the MCU relay is as shown. When a BLANK comes along in the tape, the relay operates, opening the start-magnet line and stopping the TD. Safety timer (in MCU, if used) also operates the relay.

NOTES: Model 14 TDs have varying kinds of start-magnets. Some have 1,000 ohm (approx) coils, requiring use of 120VDC power for energization. Others have 70-ohm coils, which can be used on either AC 115V or DC 120V. On AC, part of the internal resistor "R" is shorted out with a jumper wire; on DC this jumper wire is cut out. (Internal resistor is the series current-limiting unit inside the TD base)

Above TD circuit shown arranged for 115VAC power input to the TD start magnet. The simplest possible.

BASIC WIRING ARRANGEMENT FOR THE
MESSAGE CONTROL UNIT - TRANSMITTER DISTR
COMBINATION.

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Jan. 9, 1971

FIG. 1.

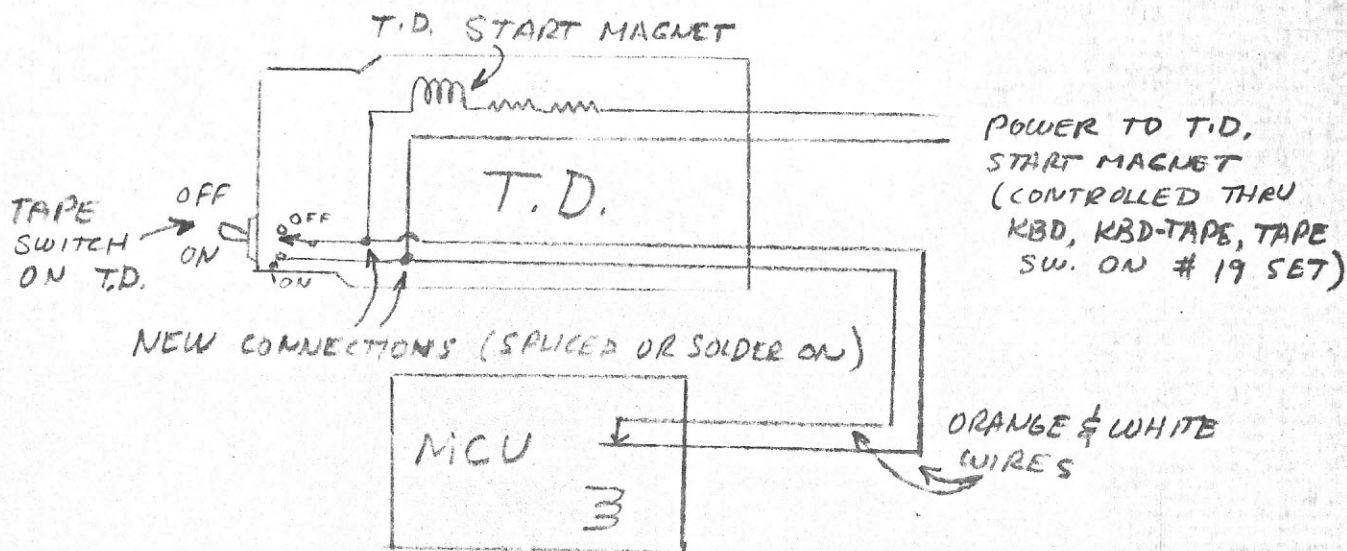
Taylor Archive at Smecc.org

It is necessary to make connections directly upon the tape switch points (contacts). That is, the MCU relay contacts will be placed in parallel with the tape switch contacts. Inasmuch as switch styles vary, it will be up to the installer to find the tape control switch connections and then splice the orange-and-white MCU tape control wires thereupon.

The best plan seems to be to make extensions of the orange and white wires, of such lengths, so that these wires can be run through the T.D. base to the front area. There is a hole in the base, through which the new wires could be led. It should be easy to make the connections directly upon the tape control switch points. (The front area can be exposed just by pulling off the U-shaped sheetmetal cover which wraps around the front of the tape reader box of the T.D.)

Be sure that the new wires do not get tangled up with the cam at the bottom of the T.D. commutator shaft. It will be well to remove the T.D. base cover, so that the new wires can be led around and fed into the front area of the T.D. After assuring that the wires are properly placed, the cover can be put back on.

The circuit connection sketch follows.



Regarding the KBD, KBD-TAPE, TAPE switch (above the right side of the Model 19 keyboard) - when this switch is in either TAPE or KBD-TAPE position, the T.D. will be ready to operate. If the switch is in KBD (Keyboard) position, the T.D. will not operate. This is the normal Model 19 arrangement. Thus, when answering an incoming call, be sure to push the switch to KBD, (UP) before starting the ACU system. The message announcement tape will not run. After conversation, the switch can be pushed down to TAPE and the ACU can then be shut down. The system will then be ready to receive calls on an unattended basis, should the resident be away at the time.

January 19, 1971

ADDITIONAL NOTES ON THE MESSAGE CONTROL UNIT

As a result of a discussion with Dr. H. Latham Breunig concerning a tape control problem on his Model 19, fitted with a MCU as per instructions in an Apcom Technical Memo, dated, Jan. 6, 1971, the notes follow.

According to the original recommendation, the MCU orange and white wires are placed in series with the Transmitter Distributor start-magnet line. As a result, with the MCU Safety Timer in operation for short message announcements only, the TD system becomes inoperative after the safety timer interval of approximately 30 seconds. Consequently, other tapes cannot be transmitted.

The Safety Timer could, of course, be disabled, and other tapes could be transmitted, just by pressing the TEST button on the MCU. One advantage of this scheme, however, is that all the other tapes could have BLANK characters punched in at their ends; in this way, the MCU will automatically stop at the end of each such tape. This assumes that the original T.D. installation does not have an "end of tape" switch installed. At any rate, this is at best a stopgap measure, and it seems needful to retain the Safety Timer, just to protect the typing unit from unnecessary hammering at the end of a line in case of a tape jam.

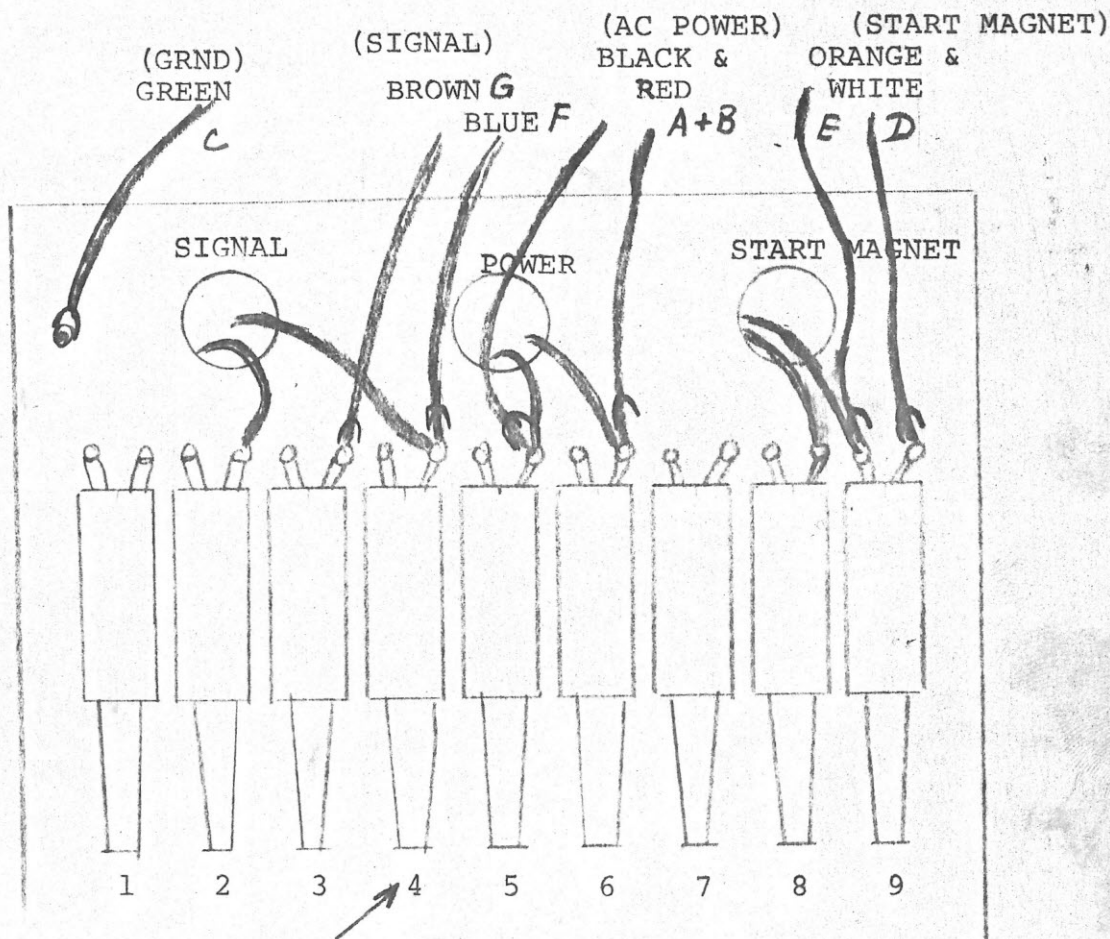
MODIFICATION:

Practically all T.D.s have start-stop switches mounted on their front panels. Such switches may be in the form of toggle switches marked ON and OFF, or may be in the form of lever switches having three positions, namely, OFF, MOTOR ON, and TAPE ON.

At any rate, we are interested in connecting onto the switch points which control the start-magnet circuit. In other words, the orange and white wires of the MCU should now be placed upon these switch points.

The result is that, with the tape switch (on the front of the T.D.) in the OFF position, the message announcement tape loop can still be started by the MCU the moment the AC power is applied to the entire ACU-MCU-Phonetype installation, in response to a delayed telephone ring. The loop tape will stop on the BLANK character, the Safety Timer can come in shortly afterwards, entirely disabling the MCU for the remainder of the time the equipment is running.

To operate the T.D. with some other tape, all one has to do is to push the T.D. tape switch to ON position. The Model 19 system will now operate normally. At the end of the tape, place the T.D. tape switch in OFF position, so that the MCU system will operate on the next unattended call. (*Don't forget to put the loop message announcement tape back on the T.D.*)



Make sure that there is no connection in the TD to jack #4. This is a tie point.

—JACKBASE FOR MODEL 14 TD—

TOP VIEW. LOOKING TO THE REAR.

Spade lugs on the MCU wires fit right onto the screw connections on the jacks. Wire as indicated. This arrangement disturbs the Model 19 layout as little as possible; all work can be done on the jackbase. The wires for the MCU can go through a grommated hole, already in place on the rear of the jackbase cover.

N.B. The brown and blue wires may need to be reversed if the sensor circuit in the MCU does not seem to respond to BLANKS, or else the TD stops transmitting almost as soon as power is applied to the system from the ACU-Phonetype installation.

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Jan. 9, 1971

FIG. 2